SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

FOREIGN MINING AND METALLURGY.

ngterne Ferrand Colliery Company has held a general meet- proprietors, at which it was agreed to sink a third pit. cided also to issue 2000 additional preference shares, in ise the necessary funds. The Iron and Steel Institute of tain has selected Liége as the scene of its annual meeting The gathering will take place Aug. 18, 19, 20, and 21. cted that the number of English visitors to this Liége will be at least 150. The Kessales Collieries Company, at will pay (August 1) a first dividend for 1873 of 3*l.* 12s.

ris copper market has been feeble, with comparatively iness passing. Chilian in bars, delivered at Havre, has 10s. per ton; ditto in ingots, 88*l.*; and Corocoro minerals pper), 86*l.* per ton. In Germany the copper markets have experienced any change; local requirements are unim- nd there is scarcely any speculation. At Rotterdam tin very feeble, sharing the depression which has prevailed rticles; Banca has brought 80 to 80¼ fls.; and Billiton, 79 fls. been no great amount of business passing in tin at Paris, s have been a little better supported. Banca, delivered at Paris, has brought 148*l.*; Straits ditto, 150*l.*; and English, at Havre or Rouen, 149*l.* per ton. The German tin mar- been rather weak, and transactions have been confined to paratively unimportant requirements of current consump- e Paris lead market has remained without change, lead various sources of supply being quoted uniformly at 23*l.* 12s. The article has not experienced any change of importance German markets. The Paris zinc market has been tend- nwards; the current quotation is 27*l.* 16s. per ton, without to place of delivery. The Breslau and Hamburg markets ibited little animation.

lgian iron trade continues in a difficult and depressed state. ill exhibit firmness, but most of the ironworks and blast- are seeking work, and they would, probably, find it easily products could be offered at a price somewhat lower than ch is imposed upon them by the exorbitant value of com- and the gradual advance in the cost of labour. The quo- -to a great extent nominal—current for refining pig are er ton, 12*l.* per ton for rails, and 16*l.* per ton for plates. At adjudication for rails for the Brussels and Luttre Railway tender was sent in; the price named in the tender was 10d. per ton. The exports of rails from Belgium in May ally returned at 5226 tons, while the total exports for the months of this year were 35,048 tons, or 281 tons less than rresponding period of 1872. The exports of pig and old iron lgium in May were 3064 tons, while those of plates amounted tons. The combined exports of iron and pig from Belgium amounted to 19,994 tons. The imports of iron and pig into in May comprised 120 tons of rails, 124 tons of plates, and ns of rough pig. Altogether, pig and iron of every descrip- e imported into Belgium in May to the extent of 12,589 ile the exports of iron from Belgium have been decreasing, orts of iron into Belgium have been increasing this year. the Belgian metallurgical establishments are profiting from nt lull in affairs to carry out sundry improvements, such as tion of Danks' puddling-furnaces, new blast-furnaces, and d rolling-mills. The proprietors of the Belgian works hope s able to produce iron better and more cheaply than hitherto. rench metallurgical works have decided to restrict their pro- within the limits of the current demand, which appears to ming every day more limited. No real revival in the iron France can be anticipated until a fall in coal enables makers ce iron upon more advantageous conditions. It is a long ce the trade has found itself in so difficult a position as at and unfortunately there is little prospect of any improve- king place during the current season. Refining pig is quoted eurthe-et-Moselle at 5*l.* 4s. to 5*l.* 8s. per ton. In the Cham- roup coke-made pig is worth 5*l.* 12s. to 5*l.* 16s. per ton; and -made pig for refining, 7*l.* to 7*l.* 2s. per ton. In the Nord tations are feeble; ordinary descriptions make 11*l.* 12s. per special qualities 12*l.* to 12*l.* 8s. per ton; some lots of rails n taken at 12*l.* 16s. per ton.

e Belgian coal trade prices still rule extremely high, but e made below the official or semi-official rates. In the Charleroi ocks of coal are said to be increasing. Boats are also being prices which are to be fixed next month. This last-mentioned ment proves that the prices of August are not yet fixed, and y may be very different to those now current. In the Liége ices are maintained more firmly than had been hoped by ers. Coke, however, is still declining, and becomes more e difficult of sale. If metallurgical industry does not re- d blast-furnace are blown out as they have been blown out e time past, what will become of the new coke-ovens which n on every side like mushrooms? This a serious question, resses more and more for consideration. In the Mons basin scriptions of coal maintain their price, but without much other descriptions have, on the contrary, experienced a dvance. The imports of coal into Belgium in the first five of this year were 235,000 tons, instead of 87,000 tons in the nding period of 1872. The imports of coal into Belgium in ne amounted to 69,000 tons. The Zollverein sent Belgium ns of coal in the first five months of 1873, and in May alone ns. The imports of coke into Belgium in the same period 000 tons. While the imports of coal into Belgium have been ng, the exports of coal from Belgium have presented a nota- inution. Thus, in the first five months of this year Bel- ported only 1,776,000 tons of coal as compared with 1,851,000 he corresponding period of 1872. The greatest diminution xports occurred in the case of the Low Countries. On the nd, there was a slight augmentation in the exports of coke st five months of this year, those exports amounting to ons as compared with 318,000 tons in the corresponding 1872. Thus, while the production of the Belgian collie- ar to have been increasing of late, the imports of coal into Belgium have become larger, while the exports of coal from Belgium have become smaller.

In France coal consumers are laying in supplies at prices below those given in the official lists, and English coal is coming to hand in large quantities. Coal was formerly purchased by the Paris Administration of Public Asssistance in the Charleroi basin, but 14,000 tons required for 1873-4 have just been contracted for with the Anzin, Lens, and Lievin Companies. The French railway companies are endeavouring to procure coal in Germany and England. One of the most important Paris houses is stated to have contracted to deliver 20,000 tons, with 2 per cent. discount, at 1*l.* 5s. 9d. per ton on trucks at Boulogne; these terms represent a reduction of 1s. 6d. to 2s. per ton as compared with those paid previously. It may be added that at present prices transactions are only concluded to meet the indispensable requirements of consumption. There appears a growing impression, upon the whole, that prices will not be maintained at their present level much longer. Some colliery proprietors seem to calculate on a revival in the demand in August, September, and October; the crisis of 1872 was, however, a rude lesson, and both companies and the public are on their guard.

THE AUSTRALIAN COAL TRADE.

The importance to the industrial interests of Great Britain that the coal resources of other countries should be speedily and successfully developed, in order to diminish the demand in this country, and thus bring about a restoration to the normal prices of fuel, has frequently been referred to in the *Mining Journal*, so that it is particularly gratifying to find that the Coal Question is now beginning to receive serious attention in Victoria, as well as in New South Wales. Mr. JOHN MACKENZIE, F.G.S., Government Examiner of Coal Fields for New South Wales, has been requested by the Victorian Government, and authorised by his own, to visit Victoria and report upon the coal fields of that colony, as to whether the seams of coal already found are workable, or whether other workable seams are likely to be found.

In connection with Victorian coal, it may be mentioned that at the Sydney Exhibition the silver medal was awarded to Mr. R. BROUGH SMYTH, F.G.S., the Victorian Secretary for Mines. This prize was strongly recommended to the exhibitor for his extensive collection of minerals, fossils, rocks, ores, gems, &c. The specimens have been carefully labelled, and are accompanied by an elaborately compiled catalogue, but, unfortunately, the depth and extent of the coal seams have not been specified. The silver medal is recommended for Mr. SMYTH'S exhibits as a whole.

From Mr. MACKENZIE'S long experience as a colliery viewer and mining engineer in this country previous to his emigration to Australia, it would be difficult to find another in whom the British capitalist would have equal confidence, especially as his 15 or 20 years experience, a large proportion of the time as a Government officer in New South Wales, must have afforded him the best possible opportunity of becoming familiar with any peculiarity necessary to be noticed in connection with the Australian coal formations. Mr. MACKENZIE'S labours as an explorer in the Australian coal fields have already supplied the readers of the Journal with many interesting articles, and we may now hope that their effect upon the commercial prosperity of both colonies will, owing to the altered condition of the coal trade, be more favourably felt than ever.

At the recent Intercolonial Exhibition at Sydney the coal resources of New South Wales were admirably illustrated, Mr. MACKENZIE having taken good care that they should be exemplified in the most practical manner possible. In elucidation of a map showing the extent of the coal fields, as personally examined by him, he annexed a statement to the effect that they embraced an area of 15,419 square miles, or 9,868,160 statute acres. One of the seams of coal, 8 ft. in thickness, under this area should, after allowing one-third for loss and waste in getting, &c., yield 34,208,298,667 tons, which at the present production of about 1,000,000 tons per annum in New South Wales, would last about 84,208 years; and at the present production of Great Britain, 112,000,000 tons per annum, our 8-ft. seam of coal would last about 751 years. In addition to this there are letters marked on the plan, showing where the vertical sections of the upper coal measures have been taken. These sections surround the plan, forming, when mounted, one large sheet. There are two sections of the northern, two of the western, and five of the southern upper coal measures; and sections of the lower coal measures are now being prepared. These sections show the various seams of coal which have been traced in the upper coal measures, with the thickness of each of their vertical distances apart at the spots where the sections were taken. They all commence at the uppermost seam of coal that has been found to be workable, which seams have all been found to underlie the Rev. W. B. CLARK'S Great Wianamatta shale beds, and they are carried down to the point where the indications of reaching the lower coal measures first commence.

It is now ten years since we noticed the beautifully prepared general vertical section of the upper and lower coal measures of New South Wales, the joint production of the Rev. W. B. CLARK (whose name will ever be remembered as the father of coal mining in Australia) and Mr. MACKENZIE, showing the various seams, some 30 in number, with the intervening strata, and very elaborate side notes, in relation not only to the strata but to the fossil flora and fauna contained in them; and it seems that this section still formed one of the greatest attractions of the Exhibition. As this section will be of special interest in connection with the samples of Australian coal at present on view at the London Exhibition at South Kensington, we may mention that we presented the section to Prof. JOHN MORRIS, V.P.G.S., the Professor of Geology and Mineralogy at University College, and do not doubt that he will permit those interested to examine it. There is also a longitudinal section of the large coal seam at the Coal Cliff, near Bulli, made also in 1863, by Mr. MACKENZIE, and showing the outcrop of the seam about 40 ft. above sea level. A vertical section of the same seam accompanies it, showing the various strata for a depth of 1000 ft., with a thick bed of clay-iron ore overlying the seam.

To render the plans and sections more valuable, Mr. MACKENZIE likewise exhibited at Sydney a very fine collection of fossil plants which are alone found in the strata connected with the upper coal measures; and also a collection of fossil plants and shells taken from the strata lying above, below, and between the lower coal measures of the colony. These exemplify the various strata lying between the various coal seams in the north, west, and south of the colony. A case of specimens from Wingen contains a number of very interesting fossils. There are also two large slabs, showing some very beautifully marked specimens of the fossil flora—the Glossopteris and the Sphœnopteris. Another case contains a collection for the Government of the lower carboniferous fossils, in great variety; and a sixth case contains a very choise assortment of fossils, taken from 50 yards above Russell's cannel seam at Stony Creek.

Much interest was taken in a variety of samples of coal, cannel, and petroleum oil shales, all labelled with the locality from which they came, with the position and thickness of the seam from which they were taken, the quality of the coal, its specific gravity, and the use to which it is best adapted.

As evidence of the progress which New South Wales is making towards becoming independent of other countries for her supply of coal, it is mentioned that a sample of coal from England was looked at with great curiosity, as such a thing as English coal is hardly to be seen in the country in the present day. This coal costs 21s. per ton on board the ship in London. The Newcastle coal is considerably cheaper, and were the trade properly developed could doubtless be made to replace English coal in a large number of markets, where it has now almost a monopoly; and to judge from the samples of petroleum oil and cannel coal sent to this country, it would probably now pay to ship that quality to England, since it is in every respect equal to the celebrated Boghead of Scotland, and it could be sold in the Thames below the present market price of the Scotch material. The importation of New South Wales cannel appears to be quite feasible, and will doubtless be made the basis of very successful commercial enterprise.

MINING IN COLORADO—THE TERRIBLE.

SIR,—There have been rumours in circulation for some time past of great discoveries having been made in this mine, but, to the mining public, the notices of the press are somewhat vague, inasmuch as no definite data of calculation are given. Being engaged in an extensive geological survey of the mountains around the Terrible, I availed myself of the opportunity of paying a visit and ascertaining for myself, by a practical examination, the facts, and, if advisable, to communicate the results to my London friends; but as I have no time to write to them individually, I will thank you to publish the following few remarks in the *Mining Journal*, and show any gentlemen that may call on you the sketches, estimates, and valuations herewith enclosed, which please keep for future reference, as some day they may be considered interesting, and useful in a scientific point of view. Now, gentlemen of my profession over here, when speaking of the silver mines of Colorado, take the Terrible and Brown Mines as a standard of comparison, as they are really the only well-proved mines in Clear Creek County, although there are others of recent discovery that have paid much larger annual *pro rata* profit for the short time they have been in actual operation, such, for instance, as the Colorado Central, over the Great Marshall tunnel in Leavenworth Mountain; the Pelican, in Sherman Mountain, near Terrible; the Caribou, in Boulder County; and recently the Wantoga, one of the lodes of West Pewabec, in Russel Gulch, Gilpin County: but the Terrible, being exclusively confined in its geological position to the syenitic granite formation, must always render it peculiarly interesting to the mineralogist and the miner. The lode has a magnetic course in the fifth level, which is the 44 fm. level below the gulch, or the 10 fathom below the tunnel N. 52 E. (see section), varying slightly as it descends, alternating from vertical to 80° on either side, but with a tendency to the north-west; the actual width of the lode, or mineral course carrying the rich veins of ore, has never to my knowledge yet been ascertained. I have reason to believe there will be found in due time very fine deposits of silver north of the present workings (see cross section of stopes, fig. 3). I think the indications are positive, for I cannot find any part of the felspathic gangue but what carries a trace of silver; there are five levels, and they are sinking now for a sixth, the shaft being down about 40 feet. The rich shoots of ore all dip to the westward (see diagram of the workings, fig. 1); that part of the lode which is not coloured is all good orey ground, but not rich, the coloured part is the rich zone of ore, carefully measured from the first commencement of the mine. The section, fig. 2, represents the exact appearance of the lode on June 7, at the west end of the fifth level, finding it to be much richer and far more productive than I ever anticipated, and as a question some day might arise in regard to my valuation of the end, as it has done before in an adjoining mine, I asked Mr. Teale, the manager, to accompany me underground, and assist, as well as check off the measurements, so that there should be no mistake, which he very kindly did, bringing with him Capt. Lampshire, the underground agent, there being, also three other gentlemen present who were desirous of seeing mineral sketches taken by an "Old Country miner."

The ore broken from the several parts of the lode was kept separate, and sent to my office in Central City, where, on my return home, they were carefully analysed for quantity by myself, but no assays for quality were made. These specimens are now preserved for future reference. In diagram, fig. 2, the veins Nos. 1, 4, and 7 are composed of silver-lead and zinc-blende, with some copper; I call it "mixed" ore. They aggregate 3 inches thick; specific gravity 3·67, equal to 230 $\frac{625}{1000}$ lbs. per cubic foot, producing $\frac{937}{1000}$ tons of 2000 lbs. to the fathom of ground. Veins No. 3 and 5 are all solid rich ore that will exceed 700 ozs., as there is a great deal of brittle silver with it; some selected specimens I broke will assay 1500 to 2000 ozs. The specific gravity is 6·754, therefore weighs 422 $\frac{125}{1000}$ lbs. to the cubic foot, and as they average 9 inches thick collectively, the yield is 5 $\frac{698}{1000}$ tons per fathom, making the contents of the lode in this end 6 $\frac{635}{1000}$ tons per fathom. How far it will hold on like this is impossible for anyone to say. It presents a most beautiful sight, one seldom seen in any mine in any part of the world.

Diagram No. 3.—This is a cross section of the stopes above the fifth level, taken at a point about 40 feet east of the end. The veins Nos. 1, 4, 5, 6, and 7 aggregate 8 inches: it is mixed ore—viz., com-

posed of lead and silver, zinc, blende, iron, and auriferous pyrites, with some little copper, antimony, and arseniates. It will average 400 ounces of silver, and I think 55 per cent. in lead, the gold varies from 12 dwts. to 1¼ oz. per ton; its specific gravity is 5·80; weighs 362¼ lbs. per cubic foot, therefore produces thus—

$$\frac{5{\cdot}80 \times 62{\cdot}5 \times 36 \div 3 \times 2}{2000} = 4{\cdot}350 \text{ tons per fathom.}$$

Mr. Teale thinks about three-eighths of the ore from all these stopes will be first-class—running up to 700 ounces of silver to the ton. The day before my visit a strong feeder of water was cut, which partly flooded the shaft, therefore I could not get to see the bottom, but was informed that the courses of ore are as good below as they are above. All the works on the mine are in first-rate condition, the new dressing-floors, with the hand-jigs and their apparatus, are a perfect success. All the underground operations are conducted in a most miner-like manner, reflecting the greatest credit on the management. At some future day I will forward you some further particulars about this now most valuable property.

CHARLES S. RICHARDSON, Mining Engineer, &c.
Central City, Colorado.

[We have received the sketches, estimates, and valuations referred to by Mr. Richardson, and we shall be happy to show them to any interested parties who may call at our office.]

MINING IN COLORADO—ROGERS'S PUMP.

SIR,—We notice your correspondent in Colorado, Mr. H. B. Grose, in his letter in the Supplement to the Journal of May 24, utterly condemns a pump manufactured at our works, and now in use in the mine of the Bobtail Gold Mining Company, in Colorado. This pump is the invention or Mr. A. R. Rogers, the superintendent of the above-named mine, and, for the purpose designed, has proved a most efficient pump. The only serious stoppage occurred about a fortnight since, when they were obliged to shut off steam from the pump on account of a deficit in the boiler. It required some 36 hours to repair the boiler, and in the meantime the inflow of water had filled the mine to the level of the tunnel, and it was flowing out of the tunnel at the rate of some 300 gallons per minute, this being about the natural inflow of water into the mine. You will bear in mind that this left the pump over 50 feet under water, but upon giving steam to the pump, which your correspondent so recklessly condemns, it started off and had the mine quite empty of water in a little less than 14 hours.

We respectfully ask you to publish these facts in your valuable paper, feeling that the subject is a most important one, and needs a thorough ventilation.

R. J. CORY, Secretary.
Council Bluffs, Iowa, July 7.

THE EMMA MINE, AND MR. N. M. MAXWELL.

SIR,—I see in the *Mining Journal* that my name is used very freely in connection with the Emma Mine. I have not been in the mine for six months, and am not in a position to offer any opinion respecting its merits or demerits, and take no interest whatever in its affairs, therefore the remark as to my "well-known opinion" is quite incorrect. I understand it is rumoured that I am a holder of Emma shares. I do not hold a share in any mining company, and have never bought or sold a share in any American mine. I have quite enough to do in attending to the management of those in my charge. By inserting this in the Journal you will much oblige,

Salt Lake City, June 26. N. M. MAXWELL.

THE ALLEGED DISCOVERY OF TIN AT LAKE SUPERIOR.

EXTRAORDINARY EXPOSURE OF "SALTING."

SIR,—In my last communication I referred to the Canadian tin lands; since then an exposure has been made which shows the affair to have been a miserable swindle. The general public here have had no reliable means of testing the truth of the statements made by those interested, and it is likely that even some of those were misled. Early this year reports were issued by the trustees, which contained all the information, true and false, that has been current until very recently. I quote from the report:—

To the Shareholders of the Otter Head Consolidated Tin Pool.—We herewith present you with a report of our operations. * * * * In consequence of a misunderstanding between Homer Pennock and the trustees, we were unable to satisfy ourselves as to the extent and value of the tin-bearing veins which were reported to exist on the property. After the opening of navigation a party was sent in search of those veins, but without success. In October Mr. Pennock expressed a desire that the trustees and others whom they might appoint would visit the tract and examine the tin veins which had been more thoroughly opened and exposed by his men during the fall. * * * * The party reached the district on Nov. 23, returning in due time with exceedingly favourable reports, and with specimens of ore from the various veins; these were assayed with good results, as will be seen by the statement of the assayer in another place. * * * * The property now comprises a total of 28,314½ acres, embracing excellent harbours, with an abundance of timber and water-power, and all natural facilities for mining purposes.

Detroit, Jan. 14. (Signed) THE TRUSTEES.

With the report of the trustees the report of William Harris, a tin miner (?), known and reputed as an able man for 20 years past, was issued, as follows:—

A. C. Davis and Associates,—At your request, I visited and examined a tract of land of about 8000 acres near Otter Head, on the north shore of Lake Superior, Canada. The general formation of the country consists of granite, slate, and trap, all being mineral-bearing rocks, through which pass several veins carrying different minerals. The first vein I wish to call your attention to is in Otter Cove, outcropping near the water, and taking a course north-east and south west from Otter Cove, with a dip 80° south. The second vein, about 100 ft. north, with a course north east and south-west, dips nearly vertical; both of these are well defined fissure veins. In the first vein referred to tin was discovered to exist by close examination in the matrix of the vein; when a magnifying glass was applied to the matrix it developed exceedingly fine crystals of cassiterite (tinstone), so small in size as to render it difficult to recognise or determine their nature. I broke specimens from the veins with my own hands, and brought the same to Marquette, where Dr. Jennings made partial assays on different specimens, all of which contained tin; at this place the Doctor could not get the requisite chemicals to give the full percentage of the tin contained in the specimens, yet it gave satisfaction for the time being. On Dr Jennings' arrival at Detroit, more thorough assays were entered into, and the following results obtained:—From six assays, average 14 8-10 per cent., the lowest yielding 5 per cent., the highest 35; the second vein north yielded much the same as the first mentioned. The veins in question can be traced for two miles, and I have no doubt by further development the vein will be found to traverse the entire property. There are other veins on the property containing silver and argentiferous galena in sufficient quantities, I think, to well remunerate any parties to prosecute the same. The timber on the land is abundant, and is more than equal to necessary wants. Water-power is at different points sufficient for milling purposes. Taking into consideration the general facilities connected with this property, and the richness of the different veins, I regard it as one of great value, and I recommend it as such to any mining or other company.

Detroit, Jan. 9. WILLIAM HARRIS.

Other reports, louder than this, and confirmatory, as well as assayers' certificates were issued, and a good deal of confidence seemed to prevail as to the actual finding of tin in the veins on the north shore. Fancy, then, the feelings when the following appeared in the last issue of the *Portage Lake Gazette*:—

Light at Last.—The history of the bruited discovery of tin, some two years ago, on the north shore of Lake Superior is familiar to most of our readers. Little remains to be told. Recent events prove that, so far, tin has never been found in that region. The specimens which have been exhibited throughout the country and commented upon so favourably by the public press, as coming from the Otter Head Tin Mines, were brought from England or Australia. The whole thing turns out to be a gigantic swindle, involving the reputations of several persons who have hitherto stood well in the eyes of the world. As a game of "mineral salting," the Dominion tin affair attains the acme of deceitful romance, and dwarfs all similar attempts ever made. The following letter, from Capt. Wm. Harris, gives the first authentic exposure we have seen of this rascally piece of business:—

"*Sault Ste. Marie, June* 21.—*To the Trustees of the Otter Head Tin Pool.*—In November last I made a cursory examination of the supposed tin landsnear Otter Head, on the north shore of Lake Superior, spending only about two hours on the ground, the threatened immediate closing of navigation preventing a longer stay. I took specimens from two veins which I thought contained tin, and a careful assay proved the fact to our satisfaction. Having just returned from making a closer examination of the same lands and veins, I desire to report that I found unmistakeable evidences that by artificial means tin had been placed in the fissures and veins, probably in a liquid form, which afterwards assumed the appearance of artificial stone containing the metal. As proof that such was the case I found buried near these veins *four barrels* of silicate of soda, a box containing clay, and other materials, which I supposed to have been used in carrying on the deception practised upon the gentlemen who made the necessarily hasty examination in November, 1872, in company with Mr. Pennock. I found the original vein; the matrix had been worked out with a pick for some depth, and then filled with an artificial rock containing dressed tin of a high percentage. I must admit that at the time of my first visit I was deceived, and attribute the deception to the very short time given us for examination, which, under the circumstances, could not be thorough—and now declare it a fraud and swindle, perpetrated, aided, and abetted by men whom I could not believe would be guilty of so base a transaction. I regret ever having seen or heard of the property, yet it may prove valuable in other minerals, which I hope may be the case for all interested.—WM. HARRIS."

Negociations had been entered into for the sale of a portion of these lands for $500,000. The gentleman who was empowered to close the purchase left Detroit to see and endorse the statements made regarding the tin lands before his arrival on the ground, the exposure had been made. There is no question about the presence of tin, the open question being how it got there. Several barrels of tinstuff have been shipped, and specimens distributed throughout the country. It was no niggard hand that did the salting. I happened to see a piece of the artificially made vein rock; the tinstuff was broken into pieces from the size of a filbert up to an egg, and mixed in the concrete; the whole mixture was tolerably firm, the cementing material being a brownish colour, specked with green; the tinstuff was nearly white, and apparently came from a soft granite. No miner could—rather, no tin miner could—have believed that the tinstuff occurred naturally in the material in which it was embedded. The plumage of the peacock would look as much at home on the back of a crow as those solid bits of tinstuff in the brown cement. I washed some of the "vein matter" on a shovel, but could not find a trace of tin. On the whole, it was a very poorly gotten up affair, and I am inclined to think there are some parties in Cornwall who could have done better in the same business. Probably the man who worked up the tin bubble of the North Shore never in his life saw a tin lode; at any rate, I would so judge. MINER.

Keweenaw Co., Mich., July 1.

DO FISSURE VEINS PAY?

"Hon. J. P. Jones has an income of $10,000 per day from his mining interests in the Mother Lode and Comstock Mines."—*San Francisco Bulletin.*

Mining is one of the most honourable and profitable enterprises engaged in by men. It is as safe a business as raising wheat, sailing ships, or any other of the agricultural or commercial callings followed by business men. Scientific principles must, of course, be observed, and practical experience regarded, or all will be disaster in any pursuit. One of the settled rules of science and experience is this—fissure veins are practically inexhaustible, and grow richer as you descend upon them. When the earth was in a state of fusion the gold and silver being heavy metals settled towards the centre. Then came the gradual cooling process, and the Andes of South America, and Sierra Nevada of North America, were thrown up. The same convulsions that cast up the mountains threw up these metalliferous veins towards the surface. Accordingly, we find the Sierra Nevada Mountains to carry gold on the western and silver on the eastern side. The only two fissure veins yet discovered on the West Coast of America are the Mother Lode gold vein, in California, and the Comstock Lode, in Nevada.

These two veins run northerly and southerly in exact accordance with the general direction of the mountains; they are both in the foot-hills and easily accessible from the plains upon the eastern and western borders; they are almost exactly parallel with each other. They carry cognate metals, as the Mother Lode gold is somewhat composed of silver, and the Comstock silver is materially charged with gold. They are about 100 miles apart, and the high mountain ridge divides them. To show how entirely their presence corresponds with scientific principles, it is sufficient to refer to "Old Siluria," in which Sir Roderick Murchison foretold the presence and characteristics of these fissure veins, merely from the fact that in accordance with science they must be found there, and found in character as later developments have proven them to be. Thus scientific knowledge enabled an English *savant* to disclose what the West Coast of America in this region must contain—auriferous fissure veins. It does not do to say that some of the more easterly silver fields of Nevada or Utah may not some day disclose a true fissure vein. The mines, many of them, give good promise, and deserve to be worked in a fair and business way (not poisoned too much by the over speculative element), and all right-minded men think well of them and hope for the best. But still the cause of truth as well as science requires me to say that it is an admitted fact that up to this time these two great fissure veins are the only two as yet discovered on the West Coast of America.

Now, on these veins mining has proved vastly profitable. For instance, let the following facts be borne in mind. The largest dividends ever paid by any mines in the world have been paid by the mines on these veins. The greatest proportionate net profits have been paid by these mines.

The Mother Lode Gold Vein of California has paid a greater proportion of net profit than the Comstock. Permit me to refer to a few figures. The following dividends were recently paid by two mines upon the Comstock Lode:—

January, 1872	Belcher	$ 312,000		Crown Point	—
February		312,000			$ 300,000
March		416,000			300,000
April		520,000			500,000
May		832,000			1,000,000
June		1,040,000			1,000,000
Total		$3,432,000			3,100,000

Belcher has 104,000 shares, and Crown Point 100,000 shares, of $10 per share. Since January 1, the former has paid shareholders $33 per share, the latter over $30 per share. Within a year and a-half these two mines have paid their shareholders as follows:—

Belcher	per share	$54·00	Total $5,616,000
Crown Point		51·40	5,440,000
Total		$108·40	$11,056,000

How does this show for a true fissure vein? It is also well to note that these two mines had to sink some 800 ft. in ore of very moderate richness, indeed, which scarcely paid for working (if it did pay) before they came upon this vast chimney of pay ore. And some of their neighbouring mines were getting out millions (ore yielded $14,000,000 in three years, one-half of which was net profit above the 1000 ft. level), whiles these two mines were being opened. Look, then, at the Mother Lode of California. The Hayward Amador in 14 years has yielded $10,000,000 gross, and over $5,000,000 net profit. The Keystone yielded its regular $40,000 in dividends per month. The Mahoney has yielded over $1,000,000. The Plymouth is yielding from 5 to 10 lbs. of bullion per day in its new 40-stamp mill. All of the above are in Amador county. The Idaho yields $60,000 per month in dividends. The Eureka (Grass Valley) yields from $20,000 to $30,000 per month in dividends. The Sierra Buttes (owned and organised in England) yields about $15,000 per month in dividends. While the Confidence, the Gwin, and a very large number of other Californian gold mines, which are privately worked by their owners for profit, and which never are sold upon any stock board, pay constant monthly dividends to their owners so regularly that they are called in California "the clock-work dividends."

To show how vastly profitable mining upon true fissure veins has become allow me to state that out of $3,387,160 paid out in dividends in San Francisco, June 1, 1872, the mining companies paid $2,210,000, and the banks, gas, water, insurance, railroad, and miscellaneous companies paid $177,100. With respect to the total yield of the Mother Lode, it may be stated that the aggregate sum must be made up by the returns given to the end of the year 1872, and not inferred from mere speculation. Whether 300,000,000*l.* or 200,000,000*l.* only be the yield of the Mother Lode, either result places this vein at the head of all others in productiveness in the world, and in no way impairs the substantial conclusions which can never be divorced from this great body of ore.

In view of these facts is it any wonder that the *San Francisco Bulletin* recently concluded an able editorial in favour of gold mining on the Mother Lode as follows:—"There is no doubt, as the *Bulletin* has often contended during the past 12 years, that with proper management investments in gold quartz in California would, nine times out of ten, be more certain to return dividends than those made in distant silver mines. The most regular-paying mines on this coast have been gold quartz mines, and for two very obvious reasons—gold is worth sixteen times as much as silver, and is obtained for one-sixth of the money ($5 per ton instead of $30)."

ANGLO-AMERICAN.

ON THE GREAT MONOPOLY OF BRITISH COAL.

SIR,—Accept my sincere thanks for the insertion of my letter in the Supplement to last week's Journal. I trust my remarks and proposals may be practically recognised and followed out by adoption of plans for securing unity between masters and men, and the general benefit of the British public, by crushing overbearing monopoly, and establishing genuine free trade principles, with reciprocity of action governing and directing all concerned. The wide diffusion of the *Mining Journal* and the careful reading over my letter of last week, signed "The Workmen's Friend," will, I hope and trust, produce ultimately, if not quickly, good fruits from the seed thus sown. It is very gratifying to me, and many other workmen's friends, to see and hear that the strike and lock-out threatened between masters and men in the building trades has resulted in a concession of the former, and avoidance of a nuisance and evil which can and must be obliterated altogether before long. I will, in a future letter, show how this great good can be easily accomplished.

I have read the *Times'* leading article of Monday on the result of the builders' conference. The article is evidently written by a practical, thinking man, which could not be said of the other articles on the result of the Coal Committee inquiry, to which I alluded in my letter with severity, but sincerity also. I hope to offer some comments on the *Times'* article of Monday, as I have been intimately connected and associated with the masters and men, and intermediates, for nearly 40 years, and have great respect and best feelings to both masters and men generally, as they well know; but I cannot say, as a whole, that I respect the intermediates, mischief-making, toadying foreman, who creates nine-tenths of the mischief (like the middle men of the coal trade) by acting in a spirit of stirring under false colours, To remedy and remove this evil is my one object.

July 23. W. AUSTIN, C.E., the Workmen's Friend.

THE LOSS OF THE ZENO—COAL.

SIR,—I herewith forward you the promised report upon the H[illegible] trial relative to the loss of the steam-ship Zeno.

I am happy to say the investigation has already been fraught with beneficial results. Enquiries are being made in every direction into the question of coal—first, as to the quality of various descriptions, and, secondly, into the probable means of artificial treatment of such coal as has hitherto been employed on steam-vessels at the propelling agent, or constituting the cargo. We are almost daily receiving specimens for examination from various parts of the United Kingdom, and we feel fully persuaded our enquiries will end in the most satisfactory solution of the vexed questions at issue. WM. WHITE.

Laboratory and Assay Office, 25, Finsbury-place, E.C., July 22.

THE ZENO ENQUIRY—COAL.

First, as to light carburetted hydrogen given off by the Cardiff hard brittle [coal]. To explain more clearly the cause of the explosion, it may be well to revert to the generally known fact that all existing coal has its origin in wood or vegetable substances, decomposed by the action of water and heat, with slight access of air. A portion only of the hydrogen of the original plant being oxidised has given way, carbonic acid being the only gas generated, is evolved, or remaining in cells of the brown or wood coal. Microscopic examinations of coal show that the apertures or cells found in the parent wood are not destroyed by its decomposition. Mineral coal results from the further decomposition of wood or brown coal, by which [more] formation, in addition to carbonic acid, or choke-damp, and water, light carburetted hydrogen is formed and given off. It may be estimated that 80 lbs. weight of wood decomposed and brought in the state of cannel coal would give 9 parts as light carburetted hydrogen, 6 parts as water, 27 parts as carbonic acid leaving, therefore, 38 parts as cannel coal, which is still decomposing, and evolving a large quantity of light carburetted hydrogen. This process of decomposition is still going on in all coal which has not yet arrived at the state of comparatively pure carbon, of which anthracite (which has given off as carburetted hydrogen all the hydrogen of the parent wood) is an example. This is proved by experiments made by me pursuant to instructions upon four different kinds of coal—cannel coal, bituminous coal, steam coal, and anthracite. The results are as follows:—

1. CANNEL COAL.—A piece of coal weighing (unbroken) 1456 grains, carefully broken in a porcelain mortar, weighed 1450 grains. A similar piece, of exactly the same weight, at the temperature of 70° Fahr., gave—Carbonic acid, 0·245; light carburetted hydrogen, 0·166 per cent., nearly equal to 2 cubic feet per ton, in half an hour. By microscopic examination the little cells are plainly discernible, and in addition to the original cells of the parent wood there may be seen other cells filled with yellow coloured matter, of so volatile a nature as to be expelled when the cells are exposed at the ordinary temperature.

2. BITUMINOUS COAL.—A piece of bituminous coal in the lump, weighing 256 grains, when reduced to a coarse powder weighed only 2·56 grains, showing a loss of 5 grains, equal to 0·195 per cent. A similar piece, of exactly the same weight, gave out light carburetted hydrogen equal to about 3-5ths of a cubic foot per ton, in half an hour. Microscopic examination of this coal shows the cells rather more elongated, but nearly as numerous as in cannel coal.

3. STEAM COAL.—A sample of steam coal from Thornley, a mine of the original Hartlepool Colliery Company, gives the following result:—Gas, carburetted hydrogen, evolved in half an hour equal to half a cubic foot per ton. The composition of this coal is—Fixed carbon, 79·60; ashes, 3·75; volatile matter, 16·30; moisture 0·35=100, and gives—Gas, 7188 cubic feet. Upon examination by microscope it approaches in appearance to anthracite, and is a fine steam coal, but more smoky. The Cardiff hard brittle coal, which well deserves the application, undoubtedly belongs to the class called steam coal. The Thornley coal, just referred to, although liable to give off carburetted hydrogen to a certain extent, I consider safe in comparison with the Cardiff hard brittle coal. The following are the results of two comparative examinations of Cardiff hard brittle coal:—A lump weighing 4084 grs. was found, when broken, to weigh 4090·50 grs., thereby showing a loss of 3·50 grs. The quantity of light carburetted hydrogen gas was equal to little less than 1-10th of that of bituminous coal, or 4·7ths of a cubic foot at 70° Fahr. in half-an-hour. A similar piece, weighing 4090 grs. when reduced to powder, and heated at 100° Fahr. in vacuum, and in presence of anhydrous phosphoric acid, lost 14 grs., of which 6·95 grs. were moisture. Another piece, weighing 1248 grs., lost 4 grs. when broken over a sand bath at 100° Fahr. The complete analysis of this coal shows the following percentage:—Moisture, 0·26; volatile compounds, 12·90; mineral ash, 4·76; fixed carbon, 82·68=100, giving gas 6788 cubic feet per ton. It is discovered by microscopic examination that the cells containing volatile compounds are fewer in Cardiff hard brittle than in bituminous coal, but they are, nevertheless, more numerous than ought to exist in real steam coal, and the gas they contain is undoubtedly light carburetted hydrogen.

4. ANTHRACITE.—Of this little need be said. When it is broken it shows no loss, nor when microscopically examined does it show any cells.

GENERAL OBSERVATIONS.—The Cardiff hard brittle coal is so brittle as to be easily broken by the hand, and this sufficiently explains the explosion in the Zeno, on board of which the breakage by trituration could not fail to disengage a large quantity of inflammable gas, which appears to have had no means of escape, except through crevices in the bulkhead of the bunker, into the adjacent forepeak into which the lighted candle was carried. In short, the explosion must be attributed to the breakage of the larger pieces of coal into smaller fragments, thus liberating the carburetted hydrogen, which, being very much lighter than air, could not fail to ascend, and was unable to escape when accumulated at the top of the bunker, except by permeation through the bulkhead into the forepeak. The whole space having been shut up air-tight by the closing of the hatches for two days explosive when a naked light came in contact with the gas was inevitable. For the verification of the accuracy of this explanation of the accident I tried the following experiment:—I placed 10 lbs. of the Cardiff hard brittle coal in an iron cylinder, closed, but provided with two pipes, one made of iron, going to the bottom, and the other of glass, just entering the upper part of the interior of the cylinder. The iron tube was shut air tight, and the other connected with a curved tube leading under a measured flask full of water. The whole was placed on a table for 12 hours, exposed to the ordinary temperature of 61° Fahr. The cylinder was shaken every half-hour, so as to move the coal inside; at the end of 12 hours it yielded pure carburetted hydrogen 4 cubic inches. The whole was then subjected to a temperature of 100° Fahr. for 36 hours; the quantity of gas collected thereby was at the rate of 36 cubic inches, or 4 cubic feet, 138 cubic inches per ton. I can only conclude that the explosion on the Zeno was due to the light carburetted hydrogen having been disengaged by the breakage and trituration occasioned by the action of the ship's motion on so brittle a kind of coal. So far my observations have had reference to the tendency of the different kinds of coal to generate explosive gases.

There is yet another important question to be considered—viz., the liability of coal to spontaneous combustion, which arises from causes quite distinct from those which produce explosive gases. For the prevention of the latter I think that ventilation would have been effectual if availed of by a special system of shafts to the bunkers or places in which the coal is deposited. I am of opinion that spontaneous combustion had nothing to do whatever with the explosion of the "Zeno." To produce spontaneous combustion I consider that a certain amount of iron pyrites in the coal is necessary, and the quantity must exceed 1½ per cent.; spontaneous combustion only takes place when the coal is reduced to dust in a wet condition, and having a sufficient quantity of air to oxidise the iron pyrites, in which case the sulphur is converted into sulphuric acid, and combines with the iron, while hydro-sulphuret of hydrogen is given off in considerable amount; the gases ignite first, then the coal, but to sustain such combustion oxygen is essential, therefore the fact that the hatches of the Zeno were shut air-tight for two days furnishes an argument against spontaneous combustion. In spontaneous combustion sulphuretted hydrogen, carbonic acid, vapour of water, and sulphurous acid are generated. The two first are not explosive, and the two last opposed to combustion. I believe that very small coal never can emit gases sufficient to produce explosion, even if shut up for a month, because the cells of the coals having been exposed by breakage, the gases must have escaped, and the cause of explosion have ceased.

But the danger of spontaneous combustion, as well as explosion, should be guarded against. I will here advert to the very wise rules laid down by the Admiralty as to the qualities of coal supplied to that department. They are as follows:—

1.—The fuel should burn with a quick action.
2.—It should possess high evaporative power.
3.—It should not be bituminous.
4.—It should possess considerable cohesion of its particles.
5.—It should combine considerable density and such a structure as to be easily stored.
6.—It should be free from any considerable quantity of sulphur, and should not progressively decay. Remark, please, rule 5th and 6th.

The Admiralty not being able to find these high qualities in any given kind of coal, they ordered trials to be made with different kinds of coal in proper proportions, and agglomerated as artificial fuel combining the requisites. Those trials were made as far back as 1850 or 1851, and the only agglomerating medium they then had at their disposal was tar. Tar, however, as an agglomerating medium, I cannot answer, because—firstly, it burns too quickly in the furnace; secondly, it is liable to melt when exposed to a comparatively low temperature (100° Fahr.) even when previously baked; thirdly, it is liable to ignite spontaneously. Seeing these difficulties, I became convinced that agglomeration of fuel to be of any use must be produced by means approaching as nearly as possible to the bases of natural conglomeration, and that such a result could only be obtained by chemical action not likely to give way when exposed to great heat. I was then in France, but on coming to England I accidentally discovered after many researches the very thing I wanted at Briton Ferry. The Metropolitan Patent Fuel Company was working with a chemical process for agglomeration of the Glyncorrwg coal—silicate of soda and lime. This chemical agglomeration has not the disadvantages which are produced by inflammable ingredients as the adhesive medium which melts. This chemically made fuel can easily stand heat, because produced by latent heat, not artificial heat, but only chemical, resulting from the action of one salt on another. After many experiments on the Briton Ferry conglomerated fuel, I found that the process there adopted was the right one. It gives a smokeless fuel with higher evaporative power than even lump steam coal. The best experiment I made with it was to agglomerate 70 per cent. of anthracite, 20 per cent. of steam coal, and 10 per cent. of bituminous coal, and the result was most satisfactory. Although

process is simple and natural, and renders the fuel completely free from the ility to generate gas or spontaneous combustion, it has been hitherto found some- at difficult to carry out well and with due regard to economy, which very likely reason that it has not been worked yet on a very large scale.

was called upon by the owners of that process to suggest some other natural and by substituting sulphate of alumina in its crude state for silicate of soda and that it answered extremely well, and that it possesses the great advantage ing easily and most economically worked. I think that there is no capillarity coal. That it would not to any great extent absorb water if poured over it. I w only to observe, in conclusion, that I believe any chemist who has care- y studied the question will agree with me that fuel chemically prepared, and aching as far as possible to a natural basis, is completely safe against gene- n of explosive gases, and less liable than any other fuel to spontaneous com- ion. Every time a piece of coal (anthracite excepted) is broken volatile gas ses. If this be repeated until the piece is reduced to fragments the whole mass ved from the explosive gas, and if the piece can be reconstructed without the of detrimental ingredients a good fuel, free from the possibilities of producing losion, is the result. If reconstruction be effected by the use of pitch, tar, or other quick-burning ingredient the fuel is liable to two inconveniences:—

The agglomerating medium (particularly if anthracite or non-bituminous coal ised) is consumed more rapidly than the coal, whereby cohesion is destroyed waste ensues from the falling away of the unconsumed particles of coal.—2. The dency to spontaneous combustion is seriously increased by the addition of in- dients so highly inflammable and ignitable as tar and pitchy substances. As mere hanical agglomeration, apart from chemical agency, fails to produce a good ve fuel and inflammable materials when resorted to augment the danger of taneous combustion, it is the province of science to discover a remedy. This only be accomplished by resorting to and rendering available the chemistry of ure. Pursuing this is the only rational course. I would observe, in conformity h this principle, that coal dust, by the chemical action of silicate of soda and e in combination with it, may be converted into solid fuel, the whole of which burn without disintegration and as evenly as the best coal until entirely con- ed, but the quality of the fuel will, of course, mainly depend upon the proper- of the coal. It may, however, be said that by this process coal dust may be le into fuel more valuable than the lump from which the dust was obtained, use thus reconstructed it is divested of its explosive character; and if it is, as happens with otherwise excellent coal, naturally tender, the reconstructed does not possess that fault, nor does it derive any offensive odour from the erial by which it is consolidated. That is the process discovered by the late n. Nigonatte.

The only drawbacks attaching to this process are the expensive character of the ate of soda, the trouble of preparing it, and its tendency when combined with e, unless extreme care is employed in regulating the proportion, &c., to form ar on the one hand, and an inordinate quantity of ash on the other.

These objections, however, are entirely overcome by the substitution and use of le sulphate of alumina with the other materials, and it is procurable at less n 1-15th of the cost of silicate of soda. By this process the dust of any kind of can be agglomerated. Even anthracite will hold together in the fire, and if a portion of bituminous coal be mixed with it a fine coke is produced, and the possesses all the good qualities of the finest smokeless steam coal, divested, at ame time, of the liability to either spontaneous combustion or the generation losive gases, whilst it is also capable of enduring unimpaired the tempera- of any climate.

A. P. VASSARD.

MINERAL WEALTH OF QUEENSLAND.

SIR,—If you take a map of Australia and carefully spot this colony u will find it of great extent, one-tenth of which is not even in- bited by the squatter. In this country the richness and number riety) of minerals already discovered prove that it is the *richest d on this earth*. A better description of these extensive resources could not present to your readers than the lecture lately delivered e by Mr. H. E. King, M.L.A., a gentleman whose vast mineral perience justly entitles him to the name of the best authority in eensland. In writing of or referring to Queensland I would ask u not to mix up or confound this colony with New South Wales, any other colony of the Australian group, as the press in England nerally does (especially the *Home News* and the *Times*). We are ite separate and distinct in every way from our southern neigh- ours—different in climate, formation, and everything but language; t although the climate is hot I can safely state, after eleven years sidence, there is not a healthier country to be found.

But, to return to our Minerals. To the British capitalist a field here ists that will well repay him if carefully invested, and the extent this field is far beyond your comprehension. Our coal fields, of hich there are all the known varieties, are enormous and exhaust- ss, open for anyone to start on, and can be purchased freehold, the me as all Government mineral lands, at 2*l.* per acre. Iron in super- undance accompanies the coal in most instances. Our extensive n fields are as yet hardly touched, the shipment of which is now ily increasing (about 150 tons per week); there are also copper, ad, plumbago, antimony, silver, zinc, gold, cinnabar, fire-clay, &c. few of the copper lodes have been opened, but considering their xtent nothing has been done. Two only have paid a dividend, and ew of the copper companies can carry on, not having money enough. The mines must be sold; some of the companies have been started ith 1200*l.* cash, and the highest 15,000*l.* The Victoria Company, aving 100,000 paid-up 1*l.* shares, had only 7500*l.* cash, now all spent. f these companies not more than six are over 14 months old, and many instances the total capital subscribed is not sufficient to rospect the mines, let alone work them. There are some splendid locks to be picked up here for 2*l.* an acre, and if the capitalists of ondon would only send out thoroughly trustworthy men to go over nd inspect the country, and purchase or select some one or other of he good properties and work them, the present owners will sell heap enough those mines that they have taken up. I will in future eep you well informed upon all subjects interesting to the mining apitalist.—*Brisbane, May* 13.

CORRESPONDENT.

The Lecture of Mr. H. E. KING, M.L.A., on the Mineral Wealth of Queensland, referred to by our Correspondent, contains the following remarks, which are especially worth the consideration of all who are interested in that rising colony:—The next subject touched upon by the lecturer was our mineral resources. He enumerated the rich coal deposits existing in the various portions of the southern districts, and showed how important an element they were in the future prosperity we hoped to achieve. These coal fields were situated on the Brisbane, Mary, and Burnett rivers, and on the Darling Downs, and possessed, in the majority of instances, excellent communication between them and the centres of population. He contrasted our condition in this respect with the colony of Victoria, where large rewards were offered for the discovery of a single coal field, but without any result. In alluding to the tin mines he said that, although only discovered about a year ago, they were at present supporting a population of over 3000 people. They possessed numerous advantages for their profitable working. Situated on a table land 2000 feet above the sea level, they had the finest climate in the colony: they were also in close proximity to our best agricultural district, and the railway, which communicated with the metropolis, ran within 25 miles of the mines. The coal field at Allora was also within a short distance. It must be, therefore, apparent that this tin district must in the space of a few years be in a position to afford employment to at least ten times its present population. It was true that during the last six months these tin mines had not come up to the extravagant expectations formed regarding them, but this was more owing to the inexperience of those engaged in the work of development than to any other cause. It must also be remembered that a very wet season had intervened since their opening, and it was only within a very short time that they had got into proper working order. He thought, however, that when the fact was taken into consideration that the export of tin ore for the 12 months would amount to little short of 400,000*l.* they might be perfectly satisfied with the result. The next mineral he would allude was copper, and he might say that it appeared to be almost universally distributed throughout the colony. The districts in this province in which copper mines had been found were the Darling Downs, West Moreton, Kilkivan, Gigoomgan and Teebar, Mount Perry, and Rawbelle. Mount Perry could now be spoken of as a permanent home of the copper mining industry, and there could not be fewer than 3000 persons engaged in this pursuit in the district. When it was recollected that prior to 1871 there were only three copper mining companies working in Queensland, and that at present the scrip of 45 copper companies and 28 tin mining companies were quoted in the share-list, it must be admitted that mining in the colony had made rapid strides within a short space of time. There were, in addition to these, however, thousands of acres taken up and being worked privately by the owners. That all these companies were not successful up to the present time must not be surprising, for it could hardly be expected that in a population so small as ours the amount of capital and labour necessary to their profitable working could be found. He was convinced, however, that a large number of these properties would prove ultimately valuable, and it only required time to properly develope them. In addition to copper, we possessed mines of silver at Potosi and Yarrol, zinc at Stanton Harcourt, and antimony and cinnabar in the same district, all of which promised well. With regard to gold, he pointed out that it was generally distributed through out the colony, and in the southern portion we had gold fields at Talgai, Lucky Valley, Nanango, Gigoomgan, Jimna, Imbil, Blake Snake, Gympie, Choney Creek, Degilbo, Reed's Creek, Stanton Harcourt, Kidswold, Cania, and Enoggera. Gold mining employed a population of about 5500, out of which Gympie absorbed 4800, leaving only 700 for all the other diggings. He accounted for this latter fact by stating that, owing to the absence of capital, the smaller gold fields had never been properly developed; and the present development of Gympie was principally owing to the exertions of the miners themselves, a few of whom had been lucky in the first instance in the alluvial workings, and were thus placed in a position to provide proper machinery for the development of the quartz reefs. There was a great difference in this respect between the Queensland and Victorian gold fields, as in the former there was almost an entire absence of the large alluvial drifts which had been discovered in the latter colony. The greater portion of the Queensland gold had, therefore, to be abstracted from quartz reefs; and as the miners were generally destitute of the means of providing crushing-machines, the development of the fields, under the present circumstances, was necessarily slow. The yield of gold from Gympie during the year 1871 was 45,464 ozs., valued at 170,000*l.*; and as this was obtained from 19,124 tons of quartz, it gave an average yield of 2 ozs. 7 dwts. 18 grs. per ton. It was satisfactory to know that the yield from this field was likely to keep on increasing rather than otherwise; for in the deepest sinkings, which were now about 350 ft., the reefs seemed to improve, and the best stone was being obtained. He controverted the statement put forward to the effect that the gold obtained in Australia had cost more in the raising than it was really worth, and asked, if this were the case, where the 350,000*l.*, which, under such a state of circumstances, would have been squandered at Gympie, had come from? He also showed that the gold mining industry was not to be judged by the ill success of an apparently large number of miners. If the same criterion were applied to any other pursuit in the colony, he asked what would be the result? They all knew that for one successful squatter there were four unsuccessful. Still, no one on this ground condemned pastoral pursuits as an unprofitable speculation. In dilating on the immense mineral resources of the colony, he mentioned, as a remarkable fact, that wherever heavy mineral deposits had been discovered coal beds were found in the close vicinity, and pointed out numerous instances. He pointed out how much more advantageous our position was in this respect to that of Victoria, where gold alone was the only branch of mining in existence, and stated his belief that if the same mineral resources were enjoyed by that colony its population would now be counted by millions. When Queenslanders heard Victoria spoken of as the premier colony, it should only act as a spur to make them advance to that position which they were entitled to maintain in the Australian group.

IS GOLD MINING PROFITABLE?

[We have been requested by the writer to publish the following letter, which was originally addressed to the *Melbourne Age*.]

SIR,—In a previous letter I promised to give further particulars of a system to be adopted for ensuring a greater certainty in gold mining, and making it a safe and profitable investment for capital. The vast quantities of gold that have already been produced by appliances that in many instances are of a very primitive character, and where much valuable time and labour have been lost through want of skill and experience in directing it, proves most plainly that if mining be carried on with more energy and system the field for operations is, practically speaking, unlimited and inexhaustible.

The chief consideration in mining is to work with profit mines that only give a low average yield. Almost anyone can profitably work a rich mine, but the working of poor mines requires economy in labour, skill in direction, and first-class appliances for raising and reducing the ores.

It is now demonstrated beyond doubt that quartz reefs of a fair average thickness, and where the stone can be worked without any great difficulty, can be profitably worked at an average yield of 2½ dwts. per ton (and in some instances less); but for working such stone as this it is necessary that the machinery and batteries should be of the best description, the claims be of large area, and the works be conducted in a regular and systematic manner.

The last quarterly returns state there are 3224 distinct quartz reefs actually proved to be auriferous in Victoria, and only 16,824 quartz miners working them, or about five men for each quartz reef. I have no doubt many of these reefs are the same, but under different names. However, there are a vast number of reefs that have been proved to be auriferous that have been partially worked in places, and have had to be abandoned by the discoverers because they were unable to procure and erect the necessary appliances to enable them to work the mine to advantage, or the expense of carting and crushing was too much to leave a fair margin of profit to the miner.

Gold mining has, unfortunately, been too much confounded with speculation or share dealing, and the real and imaginary losses of share dealing are attributed to losses in mining, whereas it has in reality nothing to do with it. The real losses in legitimate mining are a mere nothing compared to share dealing. Thus the loss by depreciation in the value of shares in the Great Extended Hustler's Company and the Tribute Company adjoining are about equal to nine months' wages for the 6496 miners employed in the Sandhurst district; but would anyone be foolish enough to say the Hustler's Company's mine is not profitable because there has been a sudden fall in the price of stock to the extent of more than a quarter of a million? The chief losses in mining are through ill-directed and misapplied labour in commencing mining operations and abandoning them before anything has been proved for or against the mine. Thus a large amount of labour is wasted and frittered away by a species of peddling, fossicking, and shepherding, not only by mining companies, but by the co-operative miners, either through want of skill and knowledge in directing the labour, or through want of means to procure the necessary and efficient machinery to economise and utilise their labour to advantage; also by having the claims too small, and sinking five or six shafts under as many different companies, with separate managements, where one shaft, one company, and one management would be sufficient. By having the claims of large size, and the mines systematically worked, would be ensured a greater certainty of success; in fact, by the aid of science, effective mechanical appliances and skilled labour, gold mining (more especially quartz mining) is reduced almost to a certainty of being a profitable investment. The chief cause of disappointment is in the anticipation of very great results by very small means.

Gold mining labour is more intricate and less able of being carefully directed and controlled by capital than that of any other labour, because the features and nature of mining operations are constantly undergoing changes and vicissitudes, that it will be found, as a rule, more advantageous to the capitalist to foster and encourage the skill and experience of the operative miner than merely to rely upon the labour only. Thus it is advisable in most instances that mining labour should participate in the result of its operation; the operative miner should be allowed the opportunity of more freely and fairly exercising his skill and judgment as well as his labour for the benefit of himself and the capitalist who aids him to develope it. When the miner is interested in the results of his own labour he will, as a natural consequence, be more thoughtful and careful in judiciously exercising that skill and labour than he would if not interested beyond his mere wages. A more judicious co-operation of capital and labour is the surest means of making gold mining more permanent and profitable. Thus, let the capitalists who are desirous of investment in mining with safety—that is, by insuring the principal with every probability of a handsome interest, but who are not initiated into the mysteries and intricacies of mining—confine their attention more particularly to the supplying of efficient machinery and appliances to enable the operative miner to utilise his knowledge and labour to advantage.

The great want of the country is more efficient mining machinery to facilitate the economically raising and reduction of ores and separation of minerals.

To practically carry out this object there now offers a most favourable opportunity. Large areas of valuable and well-proved auriferous ground are lying idle in every mining district which could be profitably worked if the operative miners could be provided with appliances on fair and equitable terms. Thus, there are many miners who would, if they had prospective interest in a mine, be able to work for months in developing its resources for their ultimate benefit, who could not do so if they had to pay down a large sum of money to raise machinery to commence their operations with.

I, therefore, propose to establish a company, with ample capital, with the sole object of supplying mining companies and co-operative parties of miners with efficient machinery; also to erect large batteries for quartz crushing wherever sufficient inducements offer. Thus this company will not risk any of its capital in unprofitable labour, the working of the mines being undertaken by the companies and co-operative parties of miners who have a thorough knowledge of the several mines they are working, and who will thus be able to utilise their experience and labour with better effect.

This company will retain possession of the machinery supplied, and its profits will be from the percentage on the gross yield of gold from the several mines so supplied. Thus the losses, under any circumstances, can be but trifling, while there are great chances of handsome profits, with a constant increase of the value of the properties by the progressive work of the several mining companies. Such a company as this offers facilities and inducements for the investment of capital that other monetary institutions cannot offer, because the capital will be invested in valuable stock and material that can always be utilised by practical miners with a certainty of profit, and every probability of interest beyond the ordinary calculations of investors. A company established on this basis will supply a great and immediate want, and will materially aid the development of mining, thereby conferring a national good; it will create additional wealth, and largely extend the present industries of the colony. It has within itself every element of success, with little risk of loss; and will be the means of putting many mines into immediate work that are now and probably would be idle for years to come, unless some such means are taken to develope them.

I, therefore, cordially invite the co-operation of a few gentlemen to assist in the organisation of a company that will, in my opinion, ultimately become the most important and profitable financial undertaking ever established in Australia.

Melbourne, May 9.

THOMAS CORNISH.

MINING IN MONTGOMERYSHIRE.

SIR,—Having read with pleasure the very interesting account of the mines in the Dyliffe district in last week's Journal, I find as an addendum that "Pedestrian" still maintains his assertion concerning the effect he thinks the patent self-acting machinery has had upon Rhoswydol; and, like a wise man, he has evidently taken to heart the advice he so kindly gives me, "Least said, soonest mended;" and I am under the impression, Mr. Editor, that "Pedestrian's" informant, by having had his head hanging over the old-fashion dressing-tub, handling his lue and gogrfach, that his eyes must have become blind to every other auxiliary to mining enterprise except the above-mentioned implements of slavery; indeed, he puts me in mind of Mr. Whalley, who generously implies every disaster in the State to Pusyism. So with "Pedestrian's" informant; he is so prejudiced against new inventions that he implies every disaster to them, and even disasters that have no being but in his own unpoetic imagination; but with all his enmity against the machines, they are undoubtedly the greatest boon to mines and mining that this century can boast of, and in every way capable of doing what they are purposed for, and also by a careful inspection of their *modus operandi*, to do one other miracle—to give a death blow to "Pedestrian" and his informant's prejudices concerning them. To "Pedestrian" I would respectfully say—Go and see for yourself, and don't be misled by the statements, or rather misstatement of others. To anyone who has the slightest knowledge of dressing they only require to be seen at work to prove to them their great utility.

Some time ago I had the pleasure of traversing the district described by your correspondent, which undoubtedly teems with mineral wealth; and speculators in mines cannot do better than turn their attention to that quarter, in which there are several other setts not mentioned by "Pedestrian," claiming their attention on the estate of Mr. Griffith Jones, whose lands are the receptacles of some of the best lodes of that district. At the time of my rambles that way I saw some very fine lumps of lead taken out of a winze then in course of sinking on one of his farms, called Esgairfochnant. I did not happen to see lead of such a good quality in any other mine in that district, being so pure and molten-like that I could scribble my initials upon it. I am told that their new discovery at Esgair-hir possesses a like feature; the men employed there at the time spoke in glowing terms of their prospects. It am astonished that capitalists should seek in a foreign clime for a source of investment when the same, and indeed a much safer, source can be obtained within a day's ride of any part of the United Kingdom; and I for one, feel obliged to "Pedestrian" and "Ich Dien" for calling the attention of the public to the district, and for your generosity in publishing the same.

July 23.

CYMRO.

MINING IN MONTGOMERYSHIRE—No. IV.

SIR,—To visit the whole of the mines in the Llanidloes district we find the best way is to start at Machynlleth—a quiet and ancient little town on the banks of the river Dovey, noted in the annals of history as being the chief town in Gwynedd (North Wales), and where the celebrated Welsh chief, Owen Gwendwr, held his Parliament. Leaving the town by the Dyliffe road we soon arrive at the old Bryn-yr-Arian, or Park Mine, at present suspended. There is evidence here of a great amount of superficial scratching, and with success, but the old men getting beyond their depth the mine was abandoned. Across the hills due south, and we reach the Llyfnant river, which here forms the boundary between the counties of Montgomery and Cardigan. Winding our way along its banks we reach Cwm Rhaiader Mine, which has long lain dormant, but having recently been taken up and resuscitated by an influential local party, it is very probable we shall soon hear more about it.

Again south, passing through the Bwlch Hyddgen sett—a very extensive grant of mineral ground, but miserably neglected—and we arrive at the Cefn Hafod, or South Dyliffe Mine; here (judging from the appearance of the lodes in the costean pits and in an adit level which they have just commenced driving) is, doubtless, an embryo Dyliffe, but, unless more energy be displayed in its development, I fear the youngest of those connected with the mine will not live long enough to reap any benefit therefrom.

Proceeding south over the mountains, passing the Severn, here only a tiny rivulet rushing down its precipitous mountain course, we next reach the Snow Brook Mine, and are now in the Llanidloes district. It is supposed that Snow Brook was first worked by the Romans at the time they were ransacking the various mineral lodes in Britain. At a more recent date it was worked by the late Capt. Reynolds, who sold large quantities of lead from here. It was then transferred to a company, who erected water-wheels and other machinery. Three or four parcels of ore were dressed and sold, realising about 3*l.* per ton—a higher price than the Dyliffe lead ore—thus proving the ore to be rich for silver, but just when all thought a prosperous future awaited it, from some cause unexplained, operations were suspended, and the machinery that had cost so much to erect was left to go to rack and ruin. A few months since the grant of this sett was again secured, when operations were commenced, pending the erection of machinery upon the old mine, on an east and west lode hitherto untouched in this sett, and from which splendid stones of lead and blende have been raised. We also saw two other lodes of great promise, and which one of the miners traced for us the whole extent of the sett; therefore, if science and natural indications go for anything, the value of this sett cannot be doubted, and it is questionable if any property in Wales ever offered greater *prima facie* evidences of success.

Adjoining this sett on the south is the Nant Iago Mine, where they are busily erecting a new 60-ft. water-wheel and renovating their dressing floors; this mine is opening out well, and improves as they gain depth; in fact, looking at the appearances of the mine, with the enlargement of the dressing-floors, &c., it is very probable that in Nant Iago Van will soon have a formidable rival.

West about a mile, and we reach the Blaen Gwy, or East Plynlimmon Mine, at present suspended. It is a pity to notice such a valuable property, as undoubtedly this is, so neglected, as, with Nant Iago on the east and Plynlimmon driving levels within a few yards of the boundary on the west, and in a good course of ore, there can be but little doubt as to the value of the property.

Winding our way along the banks of the River Wye we arrive at the Nant-y-Cawrdu, or West Nanty Mine. This mine, as also the Dol Mine, which is on the other side of the river, are idle. Both these mines are on the Van lode, the prospects are good, and each is supplied with good and substantial machinery, but as it was getting late, and we had yet a few miles to walk, we did not go over the mines, intending to visit them again some future day, and, we hope, more propitious times.—*July* 23.

PEDESTRIAN.

MINING IN NORTH WALES, AND ITS PROSPECTS—No. I.

SIR,—There appears to be very much misapprehension in the minds of certain individuals regarding the prospects of mining in North Wales, and amongst them are those who assume to be not only of the vanguard of mining, but its guiding lights. When men affect prescient knowledge it ought to be understood upon what ground it is assumed, whether as being intuitive or acquired. Inferential knowledge, humanly speaking, is usually most esteemed, because most congenial to the habits of mankind, it being comprehensible, and easily reduced to practice. We have recently seen in the *Mining Journal* the mining prospects of North Wales unmistakably depreciated, and it is to be premised that those who thus wrote had, or supposed that they had, some foundation for what they said. It is generally considered that the indications which constitute the prospects of mining are of two classes—those which relate to the present, and those which relate to the future. The first respects the lodes themselves, the second their surroundings, each of which regarded irrespective of the other would be likely to mislead, and could not, therefore, be considered as either skilful or prudent. I do not know where the line is drawn which separates North from South Wales by those who so sweepingly condemn the former division, but, geographically, North Wales comprises Anglesey, Carnarvon, Denbigh, Flint, Merioneth, and Montgomeryshire—a large extent of territory, and much too rich in its antecedents to be so unqualifiedly condemned. Within the region embraced by the northern division of Wales are individual lodes, which from their size and continuity may be almost said to constitute metalliferous zones of themselves, and of almost unparalleled productiveness. Yet no exception seems to be made in their favour, nor in favour of the country on their account, but all are alike ruthlessly disparaged, and summarily disposed of as being pre-eminently fallacious and deceptive. It is noteworthy that the parties to whom I refer, in order to provide themselves with some sort of pretext for the ill-opinion they wish to propagate concerning mining in North Wales, allege the absence of certain essential or popular esteemed features which I know from a personal examination, in some instances, is almost a pre-eminent characteristic of not only individual mines but entire districts. To allege the absence of certain esteemed features which are conspicuously present, and then to conclude the condemnation of a singularly rich and fertile region from such an assumption, is an act which should not be allowed to pass unquestioned. If the mining prospects of North Wales are fallacious, the sooner such a fact becomes generally known the better it would be in the interests of mining, but it should not be forgotten that assumptions are not necessarily facts. Something more weighty than flippant and careless expressions should be had recourse to in respect of such matters.

I anticipate for mining in North Wales a rapidly increasing popularity, and a decidedly prosperous future, contingent only on its business arrangements, management, &c., which, of course, are decidedly arbitrary, and may be such as to counterbalance the good effects desired, and totally dissipate the margin between necessary costs and the realised produce. My expectations are based upon my ideas of the physical constitution of the country, including its mineralogy and geology, and if these fail me it can only be from a misinterpretation of the nature and language of the sciences referred to, and not because they are false or deceptive in their modes of expression. If my ideas of the prospects of the country rest on an insecure basis, or are erroneously formed, I hope someone who understands these matters better than myself will correct me, as my desire is to be identified with nothing that is erroneous on the subject, either in entertaining such views myself, or being instrumental in disseminating them amongst others.

If the *savans*, or those professing to be such, in mining knowledge

and experience are able to disabuse my mind of the favourable opinion I entertain concerning the prospects of mining in this part of the country, they would confer a favour not only upon myself, but on others whose interests will be largely affected by the nature of the opinions I entertain and express. If prejudice is permitted to give tone to opinions which are gratuitously floated with whatever object, and individual lodes and entire districts of solid worth and merit are injuriously affected thereby, a public as well as a private wrong is inflicted, and probably in some cases with no higher object than the venting of cynical spleen, or indulging ignorant vanity. It will not, I think, be forgotten that a blow was recently aimed at the Van lode, on the assumption that it is not characterised by intersections of other lodes, cross lodes, or dykes. But is not such an assumption, I would ask, one of the most gratuitous and untenable which could be possibly entertained concerning that exceptionally rich vein? The character and constitution of the vein itself shows it to be fed from numberless sources by minor intersections and channels of communication, to say nothing of its fundamental underlying igneous rocks, which are here and there disrupted throughout its course. This celebrity of Wales appears to me to be analogous in many striking features with the great and prolific Comstock lode of Nevada. Each stands alone, majestic in its sphere, unique, and without comparison. Such a mass of vein matter as is comprised in the Van lode, embedded, as it is, in clay-slate, which essentially contains but little silex or lime in its composition, could not within the scope of reason but be as it is—"bunchy." The absence of the necessary ingredients in the strata to form an exuberant silicious or calcareous matrix for the galena to be generally disseminated therewith throughout the vein could not, inferentially, well result under the auspices of law and order in anything but extremes—here superabounding wealth, there absolute sterility. If Nature's laws were defective, and as a consequence minor or secondary conditions were ill, or entirely unresponding, a more general dissemination of the ores throughout the mass of vein matter might be the result, and then the result of that would conceivably be a commercially impoverished lode. Men's conceit sometimes require changes in lodes to adapt them to their conceptions of quality, without taking into consideration the fact that such changes could only be chemically produced, and that by their production in that way other changes would inevitably follow which would more than counteract the beneficial effect desired. It is very common for some men, looking through the distorted lenses of prejudice, to pronounce things what they appear to be through that medium, and delude themselves with the notion that as they appeared to themselves so they appear to others, whereas decidedly opposite views are entertained, arising, no doubt, from a more extended acquaintance with the objects to which reference is made.

To judge of the Van lode its mineralogical character and geological development should be properly considered, and to speak of such a lode without any reference to these essential features would be to speak very much at random. ROBT. KNAPP.

Llanrwst, July 23.

THE BRONFLOYD MINING COMPANY.

SIR,—In looking over your valuable Journal of July 19, I there read an account of the meeting of the shareholders of the Bronfloyd Mine, held on the property. Capt. J. Davies's report would, by a stranger reading it, induce him to think of the late agent something wrong, or that he was incapable of managing a mine such as Bronfloyd, but I had the management of it for nine years, and no complaint was ever made from or by a single shareholder, nor by any agent of any mine in the Principality, who often inspected the property. Capt. Davies promised at the last meeting, held in January last, to return 250 tons of ore for the then coming six months. The six months are gone by, and the ore is not there. Fault must fall on some one, and he makes me the scapegoat. Of the 250 tons promised 106 tons only is mentioned as having been ready. It remains to be proved by the shareholders whether this lot has yet gone to market.

If Captain J. Davies promised the shareholders 250 tons in the six months (of which he mentions 106 tons as having been brought out, and 160 tons broken underground) why should Capt. Davies give his word, and make such faithful promises, only to be broken? Rather than leave the enormous quantity of 160 tons under men's feet, he certainly should have brought some of it to surface, and not have disappointed the shareholders, the manager (Mr. Balcombe, who is also the managing director of the Queen's Hotel, Aberystwith), and damage his own future good prospects in the mining world. When I left the mine, in February, 1872, I estimated the ore, both underground and at surface, at about 200 tons—that is, 50 tons at surface, and broken underground about 150 tons.

Perhaps Mr. Balcombe will kindly inform the readers of your far-spread Journal what amount of lead he has sold from this mine (including the 200 tons) since I left, which will leave every shareholder to judge of the value of the Bronfloyd Mine, and its past and present management. THOMAS KEMP.

Pontarvyd, July 23.

THE PROVIDENCE MINES MEETING.

SIR,—Mr. Higgs not having offered any explanation relative to the discrepancy between his remarks and the contents of his letter, will you permit me to say a few words in self-defence, as well as to make a few remarks appertaining to what was said at the meeting, and the management of the mines generally? I would not attempt this but for what transpired respecting myself, which, besides being quite uncalled for, was totally untrue. Touching this matter, then, allow me to say that the time of my management of the mines was three-and-a-half years, during which, besides the ordinary and general work being carried out, and that too to the entire satisfaction of the adventurers, a 30-inch cylinder stamping engine and a 20-inch cylinder winding-engine were purchased and erected; 250 fathoms of skipway (the first introduction) were fixed in two shafts, an adit driven 150 fathoms preparatory to altering and enlarging the tin-dressing floors, 165 fathoms of new ladder-way fixed in one shaft—the old 12-in. distances being substituted with 10-in.—a new dry-house built, in which was placed a boiler and every other convenience for the comfort of the men, a very large excavation made for the purpose of depositing the dressing water, and other large sums were spent in connection with the contemplated alteration of the floors, during the whole of which time our dividends averaged nearly 10,000*l.* a-year, being larger than has been declared before or since, and I may also add that a part of our labour debits preceded the payments, and that when I left there was more than 100 tons of tin in the stone, which was paid for; this has since been sold, and they have dwindled a month behind in labour, cost and merchants' bills, and this was done at a time when dividends were being declared. It will be said, perhaps, "Well, all this may be true, and yet the mine might have been left in a very low state, and required great care to bring it into working trim;" but the facts are worthy of note that the erections and fixtures are where I left them, and that the dividends for some time after were large; and even if these had fallen off I do not see on what grounds I should have come in for any blame, as the agents at the last meeting informed the adventurers that they had fallen 30 tons of tin below their calculations, thus showing that the mine is subject to fluctuations; they were not so treacherous as this, however, while I was there, as I have no recollection that we ever came below our calculations.

Well, Sir, having I think said enough to show that Mr. Higgs's remarks at the meeting were quite out of place, I will next point out how indiscreet he would have been to have brought them forward if they were true, as in doing so he ought to have remembered that both himself and Capt. Hollow were co-workers with me, and could not possibly escape censure for being a party to quietly allowing the mine to be brought to the brink of ruin (?). At this Mr. Higgs may demur, but all who are in the habit of receiving mining documents from his office cannot fail to discover that he clings to the title of superintendent of the mines with the greatest tenacity. Capt. Hollow at the time, besides holding the position of second agent, acted as agent for the lords of the mine, and never did I on any one occasion hear him complain of what was being done or what was left undone. Surely it was the duty of these gentlemen to have displayed their abilities, whereby the adventurers should have been benefited instead of letting them lie within in such a latent state.

After the remarks referred to, Mr. Higgs went on to point out what savings they were effecting, and made a startling announcement respecting the very small sum it was costing them to draw the stuff, the principal cause of the great saving being attributed to the introduction of the wire-rope. If this statement be correct, I will ask Mr. Higgs, with all due respect, why it is that great saving source is not adopted at Trelyon Consols, where he holds a similar position as he does at Providence? As a rule, I do not like to criticise statements unless they directly affect me; but, Sir, I have learnt the wisdom of receiving some statements with a great degree of caution, and I confess that I am rather sceptical respecting what has been said about the cost of drawing the stuff at Providence—at 2½*d.* a ton. It is true that at present I have no opportunity of testing the accuracy of the statement, and until this is done it may be said that I have no right to doubt it; under ordinary circumstances perhaps I have not, but, Sir, I think there are evidences suggestive of the idea that they are not drawing the stuff at Providence much cheaper than is being done at other well-conducted mines. In order to support this idea, I will refer to "Lean's Engine Reporter," given in the *Mining Journal* of May 3 of this year—the last I have seen. In this report, while the average duty given is 50,300,000, and Dolcoath and West Chiverton stand at 65,500,000, Providence figures under 37,000,000, and is at the bottom of the list, being nearly 30 per cent. under the average duty, and not far short of 50 per cent. under that of Dolcoath and West Chiverton. Surely, Sir, in ordinary times this circumstance alone should have been a case for investigation, but doubly so at the present, when the price of coal is so very high. Putting down, then, the engine report as correct—it has never been contradicted—can we reasonably suppose that the agents at Providence are outstepping their neighbours in any particular department, or that the work is being carried out in a very masterly way?

Mr. Higgs' allusion to "their engine being out of power" is what I cannot exactly understand, as the fact must not be lost sight of that this engine formerly did all the stamping and pumping, having at the time 30 heads of stamps attached to it, and it did its work admirably. After the erection of the steam-stamps referred to this engine was entirely relieved of the stamping burden, and as there was no increase of water I fail to see why it was not equal to a part of its former duty.

The second new engine mentioned by Mr. Higgs has had no existence in the Providence Mines at Lelant. Looking at the way in which Mr. Higgs has placed my name before the public, I ought, I think, to be excused were I to go a little further in criticising his remarks, and I think there is ample room to do so. It will be noticed that he made use of the following words:—"And I do not hesitate to say that the work was carried out in a very masterly way." This, Sir, Mr. Higgs must admit is a matter of opinion, and there exists a very strong opinion, and I endorse it in every sense of the word, that great error of judgment has been shown in laying out their dressing floors. I do not make this assertion without being prepared to point out the error referred to. I trust that in future, when Mr. Higgs indulges in eulogising the acts of his agents, he will dispense with the lever of injustice towards others. A. ANTHONY.

THE MINING INTEREST, AND SMELTERS.

SIR,—The copper and tin smelters of England have a virtual monopoly: not satisfied with large profits, they are at present victimising the mining companies and the mining lords. At this time they have put the standard at so low a figure as to be really approaching confiscation. The mining companies have the remedy in their own hands; they have only to coalesce and form a co-operative smelting company to smelt their own ores, with the understanding that all the ores raised shall be only sold to their own company. As the ores are purchased on credit, and can be sold readily for cash when smelted into bars, it does not require a large floating capital, only reserves. If a suitable locality be selected near cheap fuel and easy communications, with the most improved furnaces, they will have advantages over the present smelters, and may laugh at opposition. The smelters will find too late that, not content with golden eggs, they have killed the goose that laid them. H. E.

July 25.

SPECULATING IN FOREIGN MINING SHARES.

SIR,—I do not at all wonder at Flagstaff and mines of that class varying so much in price, the wonder is that they stand as they do. Here is a mine with a capital of 300,000*l.*, and what has it to show for it?—the ore in sight, the plant, and the chances of finding more ore. If we set down the first of these at 100,000*l.*, the plant at 30,000*l.*, we have 170,000*l.* as the value of the chance of finding more ore. I really do not see how after the experience of the Emma Mine you can say its resources "have scarcely been tapped." The Emma was a famous "pocket," but it is worked out. No person can tell whether the Flagstaff may not be the same. No person can tell or give any reasonable guess beyond what he sees, and the shareholders, as I have shown, have paid a premium for their chance. It is not like a Cornish mining company, spending money in mining and seeking for ore. It is a company paying the discoverer of the mine a premium for his chance of finding more, and no man who ever put his money on a horse race, or at a gaming table, ventures more than he who puts the money on this description of property. It is a bit or a miss, and the worst of these things are that ignorant people run after them and get themselves burned. Your parson, who would not bet on a horse race or play at a gaming table, gambles at mines, too often because he does he does not know what he is doing. If people like to gamble let them do it; they may make money, they sometimes do, but they sometimes lose. I do think it is your duty as a journalist to show these things in their proper shape; that buying shares in Utah mines is pure gambling, just as much as staking money on cards or dice, and that there is not the least degree of science or ordinary venture in it.

A MINING ENGINEER.

ST. BREWARD, OR SUNONWARD MINE.

SIR,—I notice of late that this mine is brought out in 62,000 shares at 1*l.* each. Knowing the mine from having reported on it several times, I unhesitatingly say that I do not know a more promising lode left unworked in Cornwall, and an adit can be brought in 25 fathoms deep, just driven on the course of the lode in soft granite, and a deep adit can be brought in on the course of the lode 50 fathoms deep. I have not a doubt but a course of ore of some kind will be cut in the adit. Then I have to ask what this 62,000*l.* is to be called up for? I see no need for it; the ore can be cut for 2000*l.*, no engine is required but to draw the stuff from any shaft when necessary. I saw a report of late, with a name attached to it, stating they had good oxide of copper; I have since examined it, and I find it is fully expected they had found ore, but the reporter, be he who he may, did not write the truth, he saw none: indeed, it is said he never saw the mine.

I have seen enough of the working of the first party: they collected sufficient money to prove the new portion of the mine. I hope they have not shared the money, and left the poor, hard-working labourers unpaid, as they and the captain say is the case; at any rate, I can only say that 2000*l.* is all that is required, if fairly spent, to open out the mine to cut the ore. I may say more; it is a new fashion, that I am not accustomed to, to call up 62,000*l.* to do 2000*l.* worth of work; no mine will pay under such a system of working. When I worked Treburget we were not 20 shareholders; I held 1-20th; we made it a dividend-paying mine, and called up money only as we wanted it; to do so we never made calls, and shared the money among the few. It was not then the fashion to do so in Cornwall.

Widebridge, July 22. N. ENNOR.

THE PLYNLIMMON MINING COMPANY.

SIR,—I have just to hand the balance-sheet and special report of this mine, to be presented to the meeting on Aug. 1, and with your permission would like to call the attention of my fellow-shareholders to the results attending the last six months' working of this mine. I say last six months' working, for I believe the first six months of the present year there was sampled and sold some 200 to 240 tons of ore, which would leave a good profit. How, then, comes it to pass that only something like 50 to 90 tons at the outside have been raised during the spring and summer months? I expect we shall be told that it is an exceptional mine, and that hands cannot be got to man the stopes. Then I say offer as an inducement an addition to the wages of all workmen who may be set on on and after the next setting-day: if this is done, perhaps we may again get the usual monthly sampling report of 40 tons, if we cannot increase upon it. I for one should like to see a little new blood infused into the directorate, for I think it shows want of management, or, in the words of the special report, "want of knowledge or forethought" (perhaps it is both), that with something like 3000*l.* cash in hand the shaft not to have been sunk below the 12 fm. level during the whole four years the company has been in existence. I cannot attend the meeting, but hope some shareholder will take the matter up. I certainly must subscribe myself— A DISAPPOINTED ONE.

WHEAL BARNARD, AND PROMOTERS' PROFITS.

SIR,—A great deal has lately been said about promoters of mines reaping golden harvests: it strikes me very forcibly that they at least deserve a great deal of their large profits, as mining would soon become a dream of the past but for the efforts of promoters, who are the chief real supporters of mining through its many vicissitudes. A cheap share rarely sells, be the mine rich or poor. I could enumerate properties that have been offered to the world for 10,000*l.* when they have received nothing but the cold shoulder, but in the hands of clever financiers 100,000*l.* was the price asked and obtained, and I understand that the promoters received more benefits than the general body of shareholders. Naturally!

The following may, perhaps, give an illustration in the future. The Wheal Barnard (Limited) is divided into 500,000 shares of 1*s.* each, or 25,000*l.* capital. I ask the world at large to become the promoters, the 1*s.* shares are equal for the property entire 6250*l.*, and every penny goes to work the mine—in fact, by these terms the public who now invest are the original promoters, and will have their benefits by-and-bye, like all other promoters, when the shares are selling at an advanced price. The purchase price of the property is 2200*l.*, and the value of the machinery alone to remove and sell is 1800*l.* as it now stands, with the mine in fork; it could not be replaced for 5000*l.* The present promoters have spent 800*l.* upon opening up the mine, their efforts being rewarded by a rich course of silver; the company's agent informing me that in one hour he has broken 10*l.* worth of silver, and the lode improving as the shaft is being sunk; add to this, there are thousands of tons now laid open upon the copper lode that will average 30 per cent. arsenic, 3 per cent. copper, 10 ozs. of silver, and 28 lbs. of tin to the ton of stuff, the whole of which can, by the new process, be extracted upon the mine to immense profits.

Such is the mine; no predictions of what may be, but what really is in the actual present, and which are verified by the real facts. No doubt a few first-class financiers would have a capital of 50,000*l.* for such a property—40,000*l.* for themselves and 10,000*l.* for the mine—but my friends and I have proved the mine, and shown it capable of becoming a great success, and offer it to the world upon such terms that those who now invest are the promoters, and will reap the benefits usually derived as such, especially with a proved rich mine. I have struggled hard to get a good mine, and, at last, have it. As regards the interests of promoters, I can offer as credentials the fact that shares purchased by promoters in different companies for 1*s.* have through my instrumentality realised as much as 2*l.*, and if the purchasers have lost heavily by buying at 40*s.* I presume even my few worst friends will allow that the promoters at least derived some benefit from my exertions.

Buy cheap and sell dear is this life's great secret of making money: the opportunity of buying cheap now presents itself, and a good and lasting mine will accomplish the rest.—*Abbey Mount, Tavistock, July 24.* THOS. J. BARNARD.

ALLEGED FALSEHOOD.

SIR,—It must be painful to any man who endeavours to avoid lieing, both in speaking and writing, to be charged with that sin when not guilty. Some months ago at a tin mine in this county a family was discovered to be subject to a cutaneous disease, which some persons said arose from the arsenical fumes proceeding from a stack in the mine referred to. It was, however, discovered that the disease had no such origin, and the fact was certified by a surgeon who examined the family to ascertain the nature of the disease. Some months, I believe, afterwards when the disease had been cured, another surgeon visited the family and certified that he could not discover a trace of the disease, hence I was charged with writing a falsehood; a gentleman, to-day, made that charge. I had no interest in writing what was false, and I do not believe that I did so. I would rather credit the surgeon who examined the family when the disease existed, than the one who did so months after its removal.

Whatever the disease was I do not believe that it was occasioned by the arsenical vapour, because I have known many families living nearer to a much fouler burning house stack than the one alluded to, without having any disease from that cause, and in the case of the mine in question no arsenic, or very little, escaped from the stack.—*Cornwall, July 21.* TRUTH.

[For remainder of Original Correspondence see to-day's Journal.]

SEPARATING SILVER FROM LEAD.—In the separation of lead from silver some improvements have been announced by MM. Risway and Pauville, of Paris. The argentiferous lead is treated with magnesium or aluminium, either alone or alloyed with zinc, and the rich scum thus obtained is amalgamated with mercury. The inventors state that they are able to regenerate the metals which have been used in the process of extraction, and thus have greatly reduced the expense of separating the precious metal from the lead.

GRYLLS'S ANNUAL MINING SHEET,

FROM JUNE 30, 1872, TO JUNE 30, 1873,

CONTAINING

The quantity of copper ore sold from each mine, British and Foreign—Average price per 21 cwts., and the amount of money—the average standard, produce, and price for the year, both in Cornwall and Wales—The total amount of ore, fine copper, and money—each company's purchase—And the particulars of copper ores sold at the Ticketings in Cornwall from June 30, 1854, to June 30, 1873.

CORNWALL.

Mines.	Ore (21 cwts.)	Amount.	Price.
Bampfylde	58	£ 264 2 0	£4 11 0
Basset, Wheal	451	3,366 18 6	7 9 6
Bedford United Mines	1,203	3,596 5 0	2 19 6
Belstone Mine	129	1,017 4 0	7 17 6
Brookwood	1,045	10,270 12 0	5 5 6
Buller, Wheal	143	1,209 9 0	8 9 0
Boswedden	147	858 5 0	5 17 0
Botallack	30	467 15 0	15 14 0
Carn Brea Mines	1,104	5,248 7 6	4 15 0
Carn Camborne	411	1,679 19 0	4 1 0
Champion's Ore	25	135 12 6	5 8 6
Craddock Moor	571	2,872 11 0	4 13 6
Crebor, Wheal	383	1,261 2 6	3 6 0
Crenver and Wheal Abraham	1,466	7,304 0 0	5 6 6
Devon Great Consols	12,474	36,135 14 0	2 18 0
Dolcoath	40	176 16 0	4 8 6
East Basset	20	27 10 0	1 7 6
East Caradon	2,021	10,325 4 6	5 2 0
East Pool	2,312	8,029 4 6	3 9 6
East Seton	273	1,180 18 0	4 6 6
East Wheal Grenville	265	1,067 16 6	4 0 6
Florence and Tonkin	153	409 11 0	2 12 0
Friendship, Wheal	565	1,931 14 0	3 8 6
Gawton Copper Mine	1,415	3,896 12 0	2 14 6
Glasgow Caradon	2,645	14,436 7 0	5 9 0
Grenville, Wheal	33	150 19 0	4 11 6
Gunnislake (Clitters)	895	2,827 11 6	3 3 0
Hingston Down	2,890	9,007 16 6	3 2 6
Jewell, Wheal	136	465 3 6	3 8 6
Levant Mine	42	182 2 0	4 6 0
Marke Valley	3,799	13,946 17 0	3 13 6
Mellanear	1,891	7,374 18 0	3 18 0
New Dolcoath	111	662 8 0	5 19 6
New Pembroke	108	499 10 0	4 12 6
New Rosewarne	111	1,056 10 6	9 10 6
New Wheal Lovell	59	167 17 6	2 17 0
North Rosewarne	44	522 6 0	11 17 6
North Roskear	29	202 6 0	7 0 0
North Wheal Crofty	68	342 15 0	5 1 0
Pennance Mine	117	508 10 0	4 7 0
Phœnix Mines	1,124	5,482 18 6	4 17 6
Poldice Mines	148	656 3 0	3 12 0
Prince of Wales	779	4,028 12 6	5 3 6
Rose, Wheal	26	100 2 0	3 17 0
Russell, Wheal	624	1,652 5 0	2 13 0
Seton, Wheal	615	2,502 15 6	4 1 6
South Caradon	5,472	42,416 19 0	7 15 0
South Carn Brea	528	5,178 13 0	9 16 0
South Crofty	3,231	11,074 10 6	3 8 6
South Dolcoath	183	879 15 0	4 16 0
South Tolcarne	26	63 12 6	2 9 0
South Wheal Frances	200	1,509 13 0	7 11 0
St. Ives Consols	25	180 0 0	7 4 0
Sundry small mines, &c.	171	788 2 6	4 12 0
Treffry's Regulus	30	487 10 0	16 5 0
West Basset	646	5,185 7 0	8 0 6
West Caradon	729	2,545 19 6	3 10 0
West Maria and Fortescue	875	2,986 5 6	3 8 6
West Wheal Seton	2,896	16,278 0 6	5 12 6
West Tolgus	2,461	11,273 2 6	4 11 6
Wheal Damsel United	125	372 14 0	2 19 6
White's Ore	194	26 8 0	0 2 6

WALES.

Australian	49	£ 1,181 4 0	£24 2 0
Ballycummisk	648	3,394 5 0	5 5 0
Bampfylde	190	1,451 14 0	7 13 0
Berehaven	3,496	21,369 3 6	6 2 6
Brass Ashes	828	1,220 8 0	1 9 6
Burnt Ore	12	76 10 0	6 7 6
Cape Ore and Regulus	8,940	242,631 3 6	8 3 0
Cappegh	65	808 16 0	12 9 0
Clonearry	18	599 15 0	33 6 6
Concordia	263	9,181 12 6	34 18 0
Coosheen	20	190 4 0	9 10 0
Copper Precipitate	31	1,558 10 0	50 5 6
Copper Refuse	166	830 3 6	5 0 0
Copper Regulus	568	6,188 12 6	10 18 0
Copper Slag	113	691 18 0	6 2 6
Copper Ore	895	7,142 1 0	8 0 0
Del Soto	777	6,503 1 0	8 7 6
Dyliffe	84	325 10 0	3 17 6
Fursdon	1,031	3,872 0 6	3 15 0
Italian Ore	391	4,570 3 0	11 11 0
Knockmahon	2,556	16,173 17 6	6 6 6
Lisbon Ore	196	2,007 2 0	21 7 6
Libiola	105	847 17 6	8 1 6
Mammoth Copperopolis	253	4,673 10 0	18 9 6
Moonta	1,077	19,880 14 6	18 9 0
Norway	79	523 7 6	6 12 6
Paramatta	152	2,220 10 0	14 12 0
Sobral Ore	565	4,889 6 6	8 13 0
Spanish	102	1,032 15 0	10 2 6
Telhadella	181	1,339 17 6	10 4 6
Tigrony	26	593 13 0	22 16 6
Union Ore	2,021	9,062 17 6	4 9 6
Vannoni	25	255 8 0	10 4 6
Wallaroo	202	2,264 16 0	11 4 6
West Canadian	9	148 10 0	16 10 0
White Metal	6	61 10 0	10 5 0

Copper ores sold in Cornwall from June 30, 1872, to June 30, 1873.

Copper ores ..... 61,715 (21 cwts.) | Average produce 6¼
Fine copper ..... 3998 tons 10 cwts. | Average standard £110 5 0
Amount of money ..... £371,036 10s. 0d. | Average price 4 8 0

Compared with the previous year,

Copper ores—decrease. 5,828 (21 cwts.) | Fine copper—decrease.. 373 tons 3 cwts.
Amount of money—decrease... £45,176 11s. 6d.

Copper ores sold in Wales, from June 30, 1872, to June 30, 1873.

Copper ores ..... 26,030 (21 cwts.) | Average produce 17½ 1-16
Fine copper ..... 4670 tons 4 cwts. | Average standard £94 1 0
Amount of money ..... £380,642 7s. 6d. | Average price 14 12 6

Compared with the previous year,

Copper ores—increase. 6687 (21 cwts.) | Fine copper—increase.. 1595 tons 8 cwts.
Amount of money—increase... £125,982 9s. 6d.

Totals in Cornwall and Wales.

Copper ores ..... 87,745 (21 cwts.) | Fine copper ..... 8668 tons 14 cwts.
Amount of money ..... £651,678 17s. 6d.

Compared with the previous year,

Copper ores—increase ..... 859 (21 cwts.) | Fine copper—increase 1222 tons 5 cwts.
Amount of money—increase £80,805 18s.

Purchased by the Copper Companies from June 30, 1872, to June 30, 1873.

	Ore (21 cwts.)	Copper.	Money.
Vivian and Sons	13,935	1361 15	£101,879 11 7
P. Grenfell and Sons	7,319	748 6	57,753 13 9
Nevill, Druce, and Co.	17,353	1360 9	96,728 16 1
Williams, Foster, and Co.	17,076	1875 0	141,143 15 8
Mason and Elkington	10,630	816 6	59,325 18 7
Copper Miners' Company	4,628	433 19	33,190 13 10
C. Lambert	6,629	753 4	57,795 14 1
Sweetland, Tuttle, and Co.	7,366	626 11	47,251 16 8
Bede Metal Company	111	4 7	350 19 6
British and Foreign Cop. Co.	1,147	384 13	28,390 15 3
Ravenhead Copper Company.	452	135 8	11,311 8 0
Landore Copper Company	1,199	204 16	16,557 14 6

Sold at the Ticketings in Cornwall from June 30, 1854, to June 30, 1873.

Date.	Ore (21 cwts.)	Money.	Produce.	Standard.
1854	180,687	£1,185,775 3 6	6½	£136 16 0
1855	188,909	1,212,686 8 0	6½	140 2 0
1856	209,305	1,283,639 8 6	6¾	141 10 0
1857	198,697	1,276,844 12 0	6½	140 0 0
1858	183,293	1,083,728 18 6	6¾	133 6 0
1859	183,944	1,079,075 17 0	6¾	133 18 0
1860	180,449	1,079,403 4 6	6½	130 1 0
1861	176,097	1,013,400 5 6	6½	127 13 0
1862	186,662	977,017 2 6	6¼	120 9 0
1863	176,285	872,474 4 6	6¾	124 17 0
1864	166,707	858,586 1 0	6¾	125 3 0
1865	164,940	806,833 10 0	6½	118 7 0
1866	148,777	678,641 3 0	6½	107 1 0
1867	125,679	547,689 8 6	6¾	110 15 0
1868	121,815	554,029 19 0	6¾	103 3 0
1869	103,199	430,749 10 6	6¾	98 12 0
1870	90,227	374,612 0 6	7	99 11 0
1871	74,367	292,122 4 6	6½	114 17 0
1872	67,543	316,213 1 9	6½	119 5 0
1873	61,715	271,036 10 0	6¾	

—*Grylls's Annual Mining Sheet.*

The Prize Essay—Practical Mining.

No. XIII.

SECOND ESSAY—PART VII.

MINING TOOLS.

Although so well known, an essay of this purport could not be considered complete without a few comments, technical descriptions are mostly useless to the class of men to whom such information is the most desirable, therefore drawings to scale should always accompany such descriptions of tools. It may appear to the initiated in those matter very unimportant to dilate on this trivial branch of the subject, but it presents to my mind some salient points worthy of consideration, for if the work of one man is only impeded to a small degree daily, that multiplied among the mass of toilers throughout the world would show a loss not easily calculated. Give an expert, skilful miner a strong, well-proportioned, properly set, light steel pick, for instance, and another the rough, badly made, awkward tool that is often palmed off on the miner (a cruel practice), and at the end of a week's labour the difference will be clearly discernible; whilst the former will have accomplished most work with ease, the latter will have blundered through less work with excessive toil; therefore it is most economical to select the best tools suitable for the peculiarities of position, circumstances, and strata in which the men have to work. The best iron should always be employed in the manufacture of tools, and in Cornwall all iron for this purpose is selected from best selected scrap (a bar 1 inch square capable of suspending a load of 30 tons without breaking). It is cheaper and more desirable to purchase the tools direct from the hammer-mill than to make them on the mine, provided that the smith can be otherwise kept employed, but it often occurs that he has this occupation to fill up time; he should be an acknowledged good workman, as the making and sharpening of cutting or boring tools require a large amount of skill; the hardening is a point that cannot be overrated, time and care should be given to this, which often is not the case; the borers are broken at the edge, turned up or rendered useless the first blow. The smith should receive his information as the borers come back and observe their appearance, tempering them accordingly harder or softer as he find it requisite. An experienced tool smith will readily discern the former imperfections, whilst another will spoil all the steel he puts in the fire. If overheated or burned, cut it off at once, and not impose on the miners (who already have toil enough) by palming off faulty tools. The above is thought a small matter by many mine agents, but if the cost of steel, delays in progress, &c., were accounted for, it would occur to them that a little supervision in the smiths' shop would enhance the interest of the mine, and prove satisfactorily that skilled workmen, good steel, and careful tempering and working the same, will amply repay all attention given to this subject; proper records might be kept of the wear and tear of different kinds of steel, marking the borers in the middle when new, and observing the wear and tear at both ends. Sometimes the ground is very hard, honeycombed or vughy. Iron pyrites, and some elvans, almost defy penetration. Particular attention is here required to temper the bits so as to stand the uneven shocks, and prevent them from cribbing or breaking away; the best borer steel should be used, which will be found the most economical in the end, and is fast superseding the iron bar with steeled end. Those borers may be of less diameter, and being more rigid will transmit the blow with greater force, and are more easily carried about the mine; they should be annealed at the striking end, to prevent flying and splitting; foul blows and irregular turning will do more damage to the tools than anything I know of, and this should be observed that the fault may not be attributed to the smith. Good coal is also a necessary adjunct to the work of the smith, and the making and keeping in repair of steel tools. Dirty coal no doubt enters into the composition of the steel, and its best qualities are somewhat impaired. For boring in very hard ground the bit may be tempered to a straw-colour, for mild ground to a bright blue. The patterns of bits are numerous, but for metalliferous mines the outward bow or ordinary bit, as used in Cornwall, when the above remarks have been attended to, have not been excelled.

MALLETS.

If mallets are made from rolled bar-iron, care must be taken that the eye is not punched with the grain, but across it; fagotted iron bars are now mostly used, and sold at the various manufactories with scrap iron hammered to all sizes, and for all uses; this iron will punch any way, and the mallets never split or crack as when made in rolled iron, but solid cast-steel sledges, mallets, hammers, borers and picks, &c., are now easily procured, and will be found the most economical in the long run if purchased of a good manufacturer, and receive fair usage; they are exceedingly durable. I need not enumerate the many forms now in use, with their names, dimensions, and weights; they are well known, and need but ordinary care to make them; let the eye be punched quite true, that the shaft may set square, and if possible tempered under a running stream of clean water. For my own using I prefer a cast-steel hammer, well made, and set up, and believe I can strike a sharper and smarter blow than with the old steeled iron mallet.

PICKS.

The pick is the handiest tool the miner has. A poll-pick in the hands of a smart miner is a formidable weapon with which to attack the varied character of work he is called upon to pursue. This form of tool has been in use as long as mining has been known; it is represented on some of the Egyptian monuments, oftentimes used for a gad, wedge, lever, and hammer. Made well, properly set, and used with skill, there is no more valuable tool the miner can carry to his labours; many forms have been used for various kinds of work and different character of ground; but the Cornish poll-picks, as made for hard and soft ground respectively, are as good a tool as I have met with for the metalliferous miner, with the exception of the eye, which might be improved, perhaps, by making the eye twice as deep, that it may obtain a firmer hold on the shaft, making it a stronger lever, and prevent it from wincing, more compact, and not liable to become loose; this can easily be effected by purchasing the iron drawn from the hammer to form, leaving a thick lump for the eye. The moulds might also be forced into a die, having a drift fixed in same, and punch the eye nearly through, thus facilitating the work of the smith very much, and the difference in cost taking a gross of picks through to the finish should not be felt; the picks and shafts would stand a great deal more wear, and render strapping the handles and numerous other devices for fixing same useless. A number of patents have been secured to present the miner with a pick with shifting points, all of more or less merit, but none have come into any extended use, but if such a tool could be manufactured to meet the requirements of the miner for working hard ground, no doubt it would be a saving of time, material, and muscle, as the miner could take equivalent to a dozen picks in his pocket, each point not weighing over 6 ozs., and that made of the best cast steel would do good service. Many of those patents might be enumerated, but could not be understood without the aid of drawings. All poll-picks, no doubt, are modifications of the Cornish pattern, and are extensively used in all metalliferous mines; those tools as manufactured by the leading engineering firms in Cornwall are a first-class article, and there can be no excuse for those who are blundering along with cheap and imperfect tools. There are numerous kinds of this instrument, and although not in accord with the terms of this Essay, which says tools for home mines, I venture to forward a table extracted from notes and the catalogue of the Museum of Practical Geology, London. A sight of the different sizes and shapes of this tool is curious and instructive. See Table.

SHOVELS.

Shovels should all be plated or hammered from best selected scrap iron, which process of manufacture alone will ensure a good quality of iron, and being steeled with the best steel, leaves nothing to be desired. As I have intimated before, if engaged to prosecute or develope a new metalliferous mine, I certainly should make a selection of tools and appliances from the manufacturers (not agents or merchants) in the West of Cornwall, whose business it is to follow up the modern ideas of the miners, and in my experience through the mines abroad, I have met with nothing to excel the hand tools we are accustomed to wield in Cornwall. All the tools must be fitted with the best cleft ash handles; the cheap stuff often sold is the reverse of cheap. A broken shaft sometimes cause a troublesome and expensive delay; therefore the best qualities in all mining tools are the most economical, gads, wedges, fox wedges, crowbars, pinchbars, poker, powder chargers, scrapers, twists, clay irons, shooting needles, pricker, tamping bars, scoops, loop drags, swabs, sludgers, and sometimes saws, with numberless other tools and contrivances well known, and are the same in most cases for mines and quarries, need not be particularised; but must be understood by the mine agent, whose province it is not to learn after appointment, but during his apprenticeship, when he should have handled all tools in every stage of work.

DESCRIPTIONS AND SIZES OF PICKS OF VARIOUS COUNTRIES.

	No.	Length of handle.	Length of head.	Weight.
				lb. oz.
Cornish poll pick for hard ground; length over eye, 2·2 inches; of poll end, 3 inches; of pick end, 12·5 inches; depth at poll end, 1·2 inches; at pick end, 1·1 inch; width over eye, 3·1 inches; at poll end, 1·2 inches; at pick end, 1·1 inches; poll end 8 sides; point set at 85° to handle	1	26·0	17·7	4 8
Cornish poll pick for soft ground; length over eye, 2·1 inches; of poll end 3 inches; of pick end, 17·5 inches; thickness at poll end, 0·8 inches; at pick end, 0·9 inches; width over eye 1 inch; at poll-end, 0·8 inches; at pick end, 0·8 inches; point set at 83° to handle	2	26·5	22·6	2 10
Derbyshire double pick, used in rock or vein, with short points	3	29·0	15·4	4 6
Derbyshire "slitter," double, one side pointed, the other horizontal edge, 0·4 inches wide	4	29·0	15·7	3 10
Derbyshire poll pick, short bluff point; for hard veins and rock, where "slitter" is too slight	5	28·0	10·7	4 6
Northumberland, double, straight armed; arms thickened in the middle like two gads	6	25·0	18·9	4 6
Flintshire, single pointed, with short 8 sided poll	7	29·0	15·2	5 2
Flintshire, double; one wedge point arm, the other with horizontal chisel edge, 0·1 inch wide	8	29·0	21·0	5 14
Monmouthshire (coal) cutting mandrels; straight, taper directly from centre to points	9	19·1	17·0	2 12
	10	20·4	17·0	2 14
	11	33·3	19·0	3 5
Monmouthshire holing mandril, stronger and bluffer	12	33·8	19·0	3 5
	13	33·3	18·0	3 8
Monmouthshire bottom mandril; curved, double pointed	14	30·0	22·3	6 6
Monmouthshire bottom mandril; curved, 2 chisel arms, 1 horizontal, 1 vertical	15	30·5	21·3	7 3
Monmouthshire rock mandril; curved, 8 sided arms, 1 wedge pointed, 1 chisel end	16	30·7	24·0	9 5
Flintshire (coal) metal driving pick; tapered V cheek pieces	17	27·6	17·2	3 10
Flintshire (coal) holing pick; tapered V cheek pieces, chisel edged arms 0·1 inch wide with strongly curved top surface	18	28·3	15·0	2 10
Flintshire (coal) heading pick; tapered V cheek pieces, slightly curved; arms taper regularly	19	27·5	16·3	3 0
North of England (coal) lower edge horizontal; top, two inclined planes; in plan, a lozenge; diminishing from centre	20	32·0	17·8	4 5
North of England (coal) lower edge horizontal; except that the arms are bent or anchored, meeting at 15°	21	32·0	18·0	4 5
North of England stone pick; slightly anchored; tapering V cheek pieces; arms bevilled to 8 sided sections, with 4 sided pyramid at points	22	30·0	19·7	7 0
North of England stone pick, similar to the foregoing, but stronger, and more anchored	23	30·0	23·0	8 0
Saxon pick, single armed, tapered octagonal section, no poll, greatest thickness 1·5 inch breadth over eye, 2·12 inches; head set at 85° to handle	24	27·7	13·6	5 6
Russian poll pick; slender curved arm; length of pick end, 12·8 inches; greatest diameter, 0·7 inch; eye circular	25	20·5	15·4	4 3
Russian gravel pick; single curved arm; blade broadens to a spoonbill near the point	26	20·5	12·5	3 6

Other peculiarities of this instrument might be mentioned as used in Gloucestershire and Somerset, Forest of Dean, Bristol, and South Wales, &c.

WEIGHT AND STRENGTH OF WIRE AND HEMP ROPE.

Hemp Rope.		Iron Wire Rope.		Steel Wire Rope.		Equiv. Strengths.	
Circumference in inches.	Weight per fm. in lbs.	Circumference in inches.	Weight per fm. in lbs.	Circumference in inches.	Weight per fm. in lbs.	Working load in cwt.	Breaking strain in tons.
4 ×1½	20	2¾ × ⅛	11			44	20
5 ×1¾	24	2½ × ½	13			52	23
5½ ×1½	26	2¾ × ⅝	15			60	27
5¾ ×1½	28	3 × ⅝	16	2 × ½	10	64	28
6 ×1½	30	3¼ × ⅝	18	2¼ × ½	11	72	32
7 ×1⅞	36	3½ × ⅝	20	2¼ × ½	12	80	36
8¼ ×2⅛	40	3¾ × 11-16	22	2½ × ½	13	88	40
8½ ×2¼	45	4 × 11-16	25	2¾ × ⅝	15	100	45
9 ×2⅛	50	4¼ × ¾	28	3 × ⅝	16	112	50
9½ ×2⅜	55	4½ × ¾	32	3¼ × ⅝	18	128	56
10 ×2½	60	4⅝ × ¾	34	3½ × ⅝	20	136	60

Each manufacturer's ropes and chains vary to some extent in weight per fathom, and supposed safe working load calculations based on the above will be near enough for all practical purposes.

Guide ropes for pits or shafts	Circumference 2⅞ in....	3 in....	3½ in....	3¾ in.
Weight per fathom	10	12	14	16

WEIGHT AND STRENGTH OF WIRE AND HEMP ROPE AND CHAINS (ROUND).

Iron Wire Rope		Steel Wire Rope		Hemp Rope.		Chain.		Equiv. Strengths	
Circumference in inches.	Weight per fm. in lbs.	Circumference in inches.	Weight per fm. in lbs.	Circumference in inches.	Weight per fm. in lbs.	Size of Link.	Weight per 100 ft. in lbs.	Working load in cwt.	Breaking strain in tons.
¾	½			1½	¾			1½	¾
⅞	¾			1¾	1			3	1
1	⅞							4	1½
1¼	1	¾	½	2	1½			6	1¾
1¼	1¼	⅞	¾	2¼	2			7	2
1⅜	1½	1	¾	2½	2½			8	2½
1½	1¾	1¼	1	2¾	3			10	3
1⅝	2							12	4
1¾	2½	1⅜	1¼	3	3½	7-16	183	15	5
1⅞	3	1½	1¾	3½	4			18	6
2	3¼	1⅝	2	3¾	4½	½	266	20	6½
2⅛	4			4	5			22	7¼
2¼	4½	1¾	2½	4½	6	9-16	300	24	8
2⅜	5			4¾	6½			27	9
2½	5½	1⅞	3	5	7	19-32	341	30	10
2⅝	6	2	3¼	5½	8			33	11
2¾	6½	2⅛	3¾	6	9	⅝	400	36	12
2⅞	7	2¼	4	6½	10			42	14
3	7½	2⅜	4½	7	12	11-16	466	45	15
3⅛	8	2½	4¾	7½	14			49	16
3¼	8½							52	17
3⅜	9	2⅝	5½	8	16	¾	533	56	18
3½	10	2¾	6	8½	20			68	20
3⅝	11	2⅞	7	9	22			70	22
3¾	12	3	7½	9½	25	13-16	650	78	24
3⅞	13							80	25
4	14	3⅛	8¼	10	28	⅞	750	85	27
4¼	15	3⅜	9½	11	30			96	29
4⅜	16							105	32
4½	18					1	933	114	35
4⅝	20	3½	11	12	32			130	40

CONCLUDING REMARKS.

I have indicated much that may not be considered within the conditions required for this essay, but in laying out a permanent mine most of the subjects written here must be taken into consideration in connection with the "best mining machinery;" for what purpose sketches have been prohibited from the competition cannot be well understood, as they would greatly elucidate the descriptions, however rough they may have been executed. I think the "best mining machinery" may be summarised as follows, and for reasons abbreviated and attached to same—

THE CORNISH SINGLE-ACTING PUMPING-ENGINE.

Because of its economy in fuel, its durability and efficiency, high degree of expansion, isolation of steam-passages and piston cover from the cooling effects of the condenser, great speed of piston, and small amount of steam lost in steam passages. It is sad to hear so much of the deterioration of the Cornish engine, and the falling off of duty when we know such is not the case, but in few engines which are old and out of repair. A dark and prejudiced account is often given by continental and colliery engineers after inspecting our machinery superficially, for we are much behind in appearances, and keeping our machinery in that beautiful order as is done at the mines abroad, and in the waterworks of London, &c.; and this is not money squandered, as machinery kept in good repair will repay in doing better work, and more of it, and greater durability; that rough and ready style of "bal engineering" should be discarded, and all the modern appliances found really leading to economy and safety should be at once attached, and engines and boilers kept in equal repair and good order to any colliery or continental mines. The duty of engines in Cornwall (the birthplace of the pumping-engine) would be improved if the same amount of attention were bestowed on the engines now, as formerly, when "million money" was paid, enginemen encouraged, and engineers vied with each other to produce the best results, and keep the machinery in the most efficient working order, we should find the reports going up much higher, notwithstanding the bad coal now being used, and the county once so noted for its high duties would again come to the fore, and maintain its supremacy for the production of the best pumping machinery. In conclusion, I would recommend those about to erect Cornish engines to seek a manufacturer in Cornwall. Not far from where I write there is an engine said to be of the Cornish type, but doing a remarkably low duty as compared with the engines tabulated; the machine has been so mangled, and every part reduced in weight, that it is no longer a Cornish engine for weight, you must have to act the part of a fly-wheel. Wrought-iron beams may be very well for safety ("New Hartley Colliery Accident"), but they must be loaded to give the weight in motion, and a greater degree of expansion, and steadiness of motion; those are the essentials wanted in the bull-engine, which, as I have stated before, do not give so good a duty as the beam; this engine was made by manufacturers whose knowledge of pumping-engines was very limited. Cornish engines have also been built in America, but they do not turn out an engine doing the duty spoken of herein.

[*To be continued in next week's Mining Journal.*]

NORTH STAFFORDSHIRE INSTITUTE OF MINING AND MECHANICAL ENGINEERS.

Upwards of 50 members of this Institute paid a visit on Monday to Messrs. Barber, Walker, and Co.'s collieries, Eastwood, near Nottingham, amongst whom we noticed the following gentlemen:—Messrs. T. S. Wilkinson, (President), Charles J. Homer, John Macdonald, Isaac Clare (Vice-Presidents), J. Richard Haines (Hon. Sec.), J. G. Bakewell (Treasurer), T. M. Goddard, J. N. Peake, James Cope, James Ashworth, Edwin Butterfield, James H. Price, J. J. Horsfall, G. Mitcheson, John Morgan, J. Ingamells, Robert Plant, W. S. Coe, J. Coe, A. Willicombe, B. Woodworth, S. Eardley, Thomas Hancock, Robert Beswick, jun., &c., &c. Leaving Stoke at 8 A.M. by special train the party arrived at Langley Mill Station about 11 A.M. Here they were received by Messrs. G. H. Bond, Robert Harrison (Agent to Messrs. Barber, Walker, and Co.), T. L. Dickinson (Assistant Inspector of Mines), and Wm. Weston, the manager of the collieries.

The Eastwood Collieries have long been noted for the excellency of their machinery, underground offices, and their general management. At the High Park Pit 1000 tons of coal a-day can be raised; the pit is 196 yards deep, and the top hard coal, which is 5 ft. thick, is now being worked. The ventilation (100,000 cubic feet per minute) is by Waddle's fans. A walk underground in such a pit was exceedingly agreeable on Monday, the roadways being dry, clean, and well ventilated. The levels are driven out for nearly a mile on either side of the pit shaft, and the coal is being worked to the rise by virtue of gob roads. Supplied with lamps at the pit bottom, the visitors were conducted through the workings. The stables, which are capable of accommodating nearly 60 horses, are models—spacious, airy, clean, and arranged on the best principle. The main roads, supported by massive brick walls and arches, were much admired. On passing along the gob way a considerable distance, the coal-getters were found busily engaged in their labourious duties. The seam of coal was found to be, as stated, above 5 feet thick. Unlike most of the seams in North Staffordshire and other districts, the seam is a level bed of coal, almost free from gas, so much so that the men carry naked lights in all directions, though much of their safety is, no doubt, owing to the admirable arrangements for ventilation. After a thorough inspection of the works and machinery at High Park, a visit was paid to the works at Moor Green, where the fans which supply both colliers with air are stationed. They are so arranged that the whole of the ventilation can be directed to one colliery or spread over both. Some of the engineers appear to doubt the applicability of the fans to North Staffordshire mines, where the seams are on such a steep incline, but no doubt was left on their minds as to the successful application of them at Eastwood. When the new plant at the Moor Green Colliery is quite completed it will be capable of raising 1500 tons of coal a-day. The engines, of which there are two, are of 300-horse power, and are worked by 12 boilers.

On leaving Moor Green the engineers proceeded to the Sun Inn, Eastwood, where Mr. Hopkins provided an excellent dinner. The chair was taken by Mr. T. S. Wilkinson, the President of the North Staffordshire Institute, and the vice-chair by Mr. C. J. Homer. After the preliminary toasts, Mr. Homer gave "Health and success to Messrs. Barber, Walker, and Co." Speaking of the ventilating fans, he said he was more than satisfied with them. He saw them working five years ago as they were working that day, and he was told by Mr. Harrison that they had not cost one penny since they were put in motion. He had no doubt that in the course of a short time ventilating fans would come into more general operation. He was exceedingly pleased with the whole of the underground arrangements. Since he had known the coal field in that district it had been developed in a surprising manner, and he looked forward to the Derbyshire and Nottinghamshire coal field becoming one of the most important in England and Wales. The toast having been cordially received, Mr. Harrison responded on behalf of Messrs. Barber, Walker, and Co. He should at any time feel gratified if visitors to the Eastwood Collieries derived benefit from what was to be seen there. A section of the British Association had paid them a visit, as had also the South Staffordshire Mining Engineers; and there had been a general expression of approval of the fans. The fans had never had to stand for repairs, though some little repairs had to be made sometimes on Saturday afternoons to the engines. The High Park pits had been working about 10 years. The men did not work so many hours as they did formerly, but, with improved machinery the output was nearly as great as it was formerly. Mr. J. Nash Peake (Tunstall) proposed "The mining interests of the district." Mr. Bond (Nottingham), in responding, spoke of the increased working of the mines of the district, and said Mr. Woodhouse, of Derby, had done more than any other man to open up the coal of that district. He mentioned that all the mines of the district, which were less than 500 yards deep, had been secured.

Mr. DICKINSON, Assistant Inspector of Mines, proposed "Success to the North Staffordshire Institute of Engineers;" and, the toast having been drunk, Mr. HOMER responded. He observed that the Institute was only young at present, having been started about six months; but it was thriving, and had now upwards of 100 members. (Hear, hear.) He dwelt upon the advantages to the mining engineers themselves in joining such an Institute, and expressed a hope that that and future excursions might enlarge their knowledge of colliery management, and tend to the better and safer working of mines. (Hear, hear.) He had learnt much that day, and he hoped they would all profit by what they had seen. Mr. PLANT (of Cheadle) proposed "Prosperity to the North Staffordshire and the Midland Railway Companies." Mr. MICHESON (Longton) gave the health of Mr. Weston, manager of the Eastwood Collieries, which was heartily drunk. Mr. WESTON, in responding, said all the visitors to the Eastwood Collieries said they had never seen such extensive seams of coal without a fault. At High Park they had been working nearly 12 years; there were nearly 400 acres, and not a single fault worth recording on the plan had been met with. (Hear, hear.) The agents of the lessors had had no trouble in measuring up, but the lessees had had difficulties in connection with the undulations and the different inclinations. Up to the present horses had been employed to haul the coal, but they were contemplating doing the hauling in the pit by means of compressed air. They had a great expanse of coal, but in some places, where the coal dipped the contrary way, they had 15 ft.

in some places to rip. There had been a considerable number of accidents from falls of roof—indeed, far more than from explosions; but when they got to the soft coal they got a good roof. With reference to the ventilation of the mines, he said that under the old arrangement of furnaces they burnt 60 or 70 tons of coal per week for 60,000 ft. of air; now they obtained 100,000 ft. of air, at a saving of 50 per cent.; and he believed to take the same amount of air there would be a saving of 100 per cent. in the cost. That was to say, that where they paid 1200*l.* a year to keep on the furnaces, they could now obtain as much air for 600*l.* In addition to doing the hauling by means of compressed air, he hoped they would soon introduce machinery for cutting the coal, and thereby reduce the amount of cost in getting it.

The health of the Chairman having been drunk, the company began to depart, and we venture to say were delighted with their excursion.

THE PRICE OF COAL.

The following are the principal portions of the Report presented to the House of Commons by the Select Committee on Coal:—

The Royal Commission appointed in 1866 to investigate the probable quantity of coal contained in the coal fields of the United Kingdom, and the quantity of coal then consumed and exported, having presented in July, 1871, a voluminous report on the subject, your Committee have not deemed it expedient to enquire into any of the matters embraced in that report; but it may be convenient to refer to some of the conclusions at which the Commission arrived to explain more fully the present condition of the coal supply which your Committee were appointed to investigate.

It was ascertained by the most careful examination of the coal fields of Great Britain, and the production of the mines at work in them, that there was an abundant supply of coal for the present as well as for the future for many years to come; but the possible failure of the supply at some distant period was the subject of much interesting speculation, which in the main appeared to depend on the estimate which might be formed of the growth of the population and the increase of consumption of the United Kingdom, and to some extent of other countries. Your Committee deem it equally unnecessary and futile to embark in any such speculative conjectures, for they are of opinion that no adequate materials exist for giving any judgment on the subject, and that they consider they will best satisfy the object of their appointment by confining their report to a period immediately associated with the present condition of the coal supply. . . . . .

In order to ascertain the causes which have led to the scarcity of coal at this time, your Committee have enquired how far it arises from a diminution or stagnation of supply, or from an unusual increase of demand for consumption, either temporary or permanent, in its character, and the result of the information they have received may be briefly stated.

Your Committee have examined some of the most experienced colliery proprietors and managers, whose evidence acquires additional weight from the fact that some were selected as representative witnesses by important bodies of colliery owners. They concur generally in opinion that there has been considerable disturbance in the minds of the workmen employed in and about the mines, respecting the number of hours per day or per week during which the workmen deemed it to their interest to work in the mines, and that the general tendency has been to reduce the hours of labour. It has also been stated that the Mines Regulation Act, passed last session, has tended to the same result, and that the consequence of this has been the mines have not produced the quantity of coal which would otherwise have been obtained from them.

Your Committee have no reason to doubt that one of the greatest benefits which can be conferred on the mining population is to induce them to work with regularity day by day, and for such a time daily as, while it will not deteriorate their health, social comfort, or moral condition, will not result in idleness or dissipation: but, as no standard can be laid down to fulfil these conditions, it must be left to the general feeling of the workmen, improved by education, to arrive, in concert with their employers, at the proper limits for their labour. Your committee, however, is led to hope that when the employment of the men has adjusted itself to the requirements of the new law and to their desire for improving their condition, the aggregate result of the labour of the mining population will not be less than in former times.

Your committee have endeavoured to ascertain the precise effect of the circumstances above noticed on the production of coal per man employed in the collieries. The following table shows the result of the returns made by the managers of all the collieries to the Inspectors of Mines on the subject:—

Year.	Men employed.	Coal raised per man.	Year.	Men employed.	Coal raised per man.
1864	307,542	Tons 319	1869	345,446	Tons 316
1865	315,451	313	1870	350,994	321
1866	320,663	314	1871	370,881	317
1867	333,116	316	1872	413,334	299
1868	346,829	302			

But the comparison between 1872 and the former years is affected by the facts that the previous returns were not compulsory, and did not include in all cases the whole of the persons employed in the mine and about the colliery, nor do the returns admit of any account being taken of the saving of labour, either in the mine or aboveground, in consequence of improved arrangements for working the collieries or delivering the coal into wagons for transport.

The evidence given in some individual cases shows that the quantity raised per man has diminished in the last year; and, on the whole, your Committee think that the diminution in the yield per man employed in getting coal in the mine since 1871 is not much less than was shown in the table.

There is no doubt of the capacity of existing collieries to keep up the present supply of coal, and that with an adequate provision of suitable labour the supply could be largely increased; but a period of time extending over several months is requisite to open out or extend new workings, and to qualify workmen who have been otherwise engaged for the special employment in the collieries. Your committee have received sufficient evidence to show that the operations are now going on, stimulated by the present high prices, and they see no reason to doubt that in a short time the collieries now existing, and others likely to be opened, will be capable of producing a large increase of marketable coal. Your committee would call particular attention to the evidence given in answer to question 7542, showing that the double shift system in working the collieries tends both to increased facility and greater economy in production. It appears that the system is now being much discussed by employers and workmen for the purpose of extending the system to collieries in districts where it has never been introduced, and your Committee hope that when the advantages of the system have been fully understood among the workmen, it may be more extensively employed under conditions which may be satisfactory to the colliery owners and their workmen.

The general conclusion to be drawn from the whole evidence is that though the production of coal increased in 1872 in a smaller ratio than it had increased in the years immediately preceding, yet if an adequate supply of labour can be obtained the increase of production will shortly keep pace with that of the last few years. . . . . Your Committee have endeavoured to ascertain how far the demand for coal for any special branches of industry has been affected since the report of the Royal Commission. They have found a very general concurrence of opinion among the witnesses they have examined that the flourishing condition of the industry of the country and of the population has fully sustained and even enhanced the rate of increase of consumption for the purposes of industry in general as well as for domestic use. There is also an equal agreement among the witnesses that the special branch of manufacture which has extended the demand for coal to a degree which could not be met by the producers, and which led to the rise in the price of coal, was the manufacture of pig-iron and its conversion into the various forms of rolled iron, and that this increase of demand mainly came from the United States of America, and from Germany. The exceptional condition of both these countries need not be expatiated upon to explain how the demand from them first arose. . . .

In the ordinary course of trade, the fluctuation in the price of coal might have been limited to the particular quantity used specially in the manufacture of iron. The demand, however, was apparently so urgent that it soon extended itself to other qualities, and exercised an influence over the price. The prosperous state of several branches of industry produced a competition for coal which obliged all classes to pay the high price demanded rather than suffer the loss consequent upon a diminution of business or the discomfort arising from want of coal for domestic use. The production and export of iron, and the production and consumption of coal, might not be deemed sufficient to account for the great rise in the prices of those commodities, but the exact effect of any disturbance of the relations of demand and supply on prices is beyond the limit of arithmetical calculation. Price depends not merely on the quantity of the commodity, but on the motives which influence both the buyer and the seller in determining how much the one is content to receive, and how much the other is able and willing to pay, under the belief that the quantity brought to market is or may be insufficient to meet the demand. In the case of coal much of the demand is of such an urgent nature that the buyer would pay a very large price rather than be deprived of the supply he requires. Nor does the ratio of the increase of price necessarily bear any definite proportion to the ratio of diminution of supply. A comparatively small deficiency may produce a very large increase of price if the eagerness of each buyer to secure his own supply and to guard against deficiency in his own case is coupled with the ability to pay for it whatever is demanded by the seller. This appears to have been the result of the comparatively small derangement in the production and consumption of coal, enhancing its price in so great a degree.

In London as the largest example of the effect of the disturbance in the coal trade for domestic purposes it appears from the evidence of a large coal merchant that the average prices at the present time, compared with preceding years, for the best house coal, taken as a standard, are as follows:—1868, 18s. 7d.; 1869, 18s. 8d.; 1870, 18s. 6d.; 1871, 19s. 3d.; 1872, 24s. 11d.; 1873, for five months, 32s. 6d.; but it is to be observed that these are the prices of coal bought in shiploads and delivered into a barge, or on a wharf, over the ship's side, the coal tax being borne by the seller, and that the actual price to the consumer of coal delivered on his premises is generally taken in the trade to be about 5s. or 6s. above the wholesale market rate when it was low, and 6s. or 7s. now that it is high to cover all the intermediate charges and losses. The supply of coal to London by railway is subject to various conditions affecting both qualities and prices which do not admit of the same general classification.

The coal trade has been no exception to the violent fluctuations which arise when the ordinary course of business is disturbed by unusually high prices, panic demands for the moment, and speculations for the rise or fall. These have raised or depressed the average prices above quoted for short periods. In London the price on the Coal Exchange reached 45s. for two days in February last.

Your Committee see no reason whatever to believe that any effort has been made by the colliery owners to restrict the supply of coal for the purpose of creating, by such artificial means, a scarcity in the market; on the contrary, means appear to have been taken by them to meet the extra demand. The supply has been, indeed, somewhat augmented by the remarkable manner in which the small coal, formerly of no account, has now been brought to market and sold at a considerable price, to be used instead of other qualities of coal. The large stocks which were kept in some districts have also been brought to market in the last year, in addition to the current supply.

The report proceeds to state that efforts have been made among the workmen to induce them to take active means to prevent the colliery owners from increasing the output of coal, under an impression that they can thereby create a scarcity, and maintain a high rate of wages: also that the like efforts have been made to prevent the colliery owners from having stocks of coal at bank ready for use under the impression that it would confer upon the employers greater power to reduce their workmen's wages. The Committee add that as the practice has grown up in the coal trade of making contracts for delivery over extended periods of time, and as there are at the same time sudden demands for considerable quantities of coal, the Committee deprecate any attempt to prevent the supply of coal or the accumulation of such stocks.

Considering the great extent of the coal fields in Great Britain, the number of collieries at work, and the variety of coals produced, which though primarily used for particular purposes, will, at certain prices, be used for others, your Committee notwithstanding intermittent and startling fluctuations in price due to temporary causes, do not believe that any combination, either of employers or workmen, can, by artificial means, succeed in permanently affecting the ordinary results of the relations of demand and supply in adjusting the quantity of coal produced to the demand, or can permanently affect the price resulting from the state of the market: nor do your Committee believe that the interference of Parliament with the course of industry and trade in coal could produce any useful or beneficial result to the public beyond what has been arrived at in recent legislation—namely, the prevention of injury to the health and morals of children and young persons, and the prevention of accidents from wilful neglect of recognised precautions.

It has, however, been suggested that there is a distinction between permitting the free use of coal in the United Kingdom and its free exportation to foreign States, and that the latter should be restrained or obstructed by an export duty. But without entering into the subject at large your Committee may point out that there are special objections to an export duty on coal beyond those of the general policy of the country, which would not apply with the same force to many other commodities.

Nor would any duty which could have been placed on coal have had a material effect in mitigating the demand for coal, and the consequent rise in price at the present time, as it appears that the excess of demand for export was not for coal but for iron, and every ton of pig-iron exported was in effect an export of 2 or 3 tons of coal, and of rolled iron of about 6 tons of coal. The manufacture of iron in a more advanced stage and of many commodities requires a large consumption of coal. The increased export of these articles would also in effect be an increased export of coal, and if the result of an export duty on the coal itself deprived foreign countries of the means of manufacturing commodities in which coal is used, it would only have the effect of increasing the export of those commodities, and of the consumption in England of the coal required for their production, unless there resulted a general diminution of industry and trade, and a cheapening of coal by depriving the people both of their power to use it in manufacture and to purchase it for domestic use.

In conclusion, the report states that one witness was of opinion that the high price to which iron rose had the effect of checking the demand from foreign countries; but several other witnesses were of opinion that the higher prices were tending to bring about such an equilibrium of supply and demand as would not only prevent any continued rise in price, but in a short time would reduce the price; that the prices of coal which prevailed for several years before the present rise commenced were unreasonably low; that in some cases the earnings of the miners had enormously increased, and had been improvidently spent, but that this increase had generally been attended with considerable benefit to the workmen; that the rise in the miners' wages had not been unreasonable nor more than sufficient to attract the requisite labour to the mines; that the workmen, like all others connected with coal mining, should only regard their present earnings as a temporary profit which might at no distant day approach former rates, and that the State should maintain an inflexible resolution of non-interference.

THE THARSIS AND RIO TINTO COMPANIES.

Although it is, undoubtedly, praiseworthy to endeavour to enlighten the public with a view to enable them to avoid unpromising commercial enterprises, it is usually necessary, in order to profit by the advice offered, to make sure that the professed disinterestedness really exists. Now, the Tharsis Sulphur and Copper Company have, in their extreme disterestedness, incurred considerable expense to benefit the public by showing that the purchasers of a neighbouring property many times larger than their own, have acquired a concern which cannot possibly prove remunerative to those who may assist in providing the funds necessary for its development; and hence it becomes necessary to enquire whether there is any probability that the disinterestedness of the Tharsis Company may have been brought about by the fear existing among the executive of that company that the increased quantity of produce is to be brought into the market at a lower price by the rival concern will result in the ruin of the Tharsis Company. That the property of the Rio Tinto Company is many times larger than that of the Tharsis Company, and that the ore is more favourably situated for working, is not disputed, but to expect that at the present prices of 9s. 10d. per unit for copper, and 7d. per unit for sulphur, either the Tharsis or any other similarly situated company can pay dividends is simply absurd, because the entire price obtainable in the market would really represent but little more than the amount payable for freight, so that a company in a position to utilise the present period of depression in developing their mines with a view to supply the market three years hence has really better prospects than one which must carry on its operations in the meantime at a loss. It was inability to bring copper to market whilst prices were low that gave the Cape Copper Company their enormously large profits, and similarly it is the necessity to sell in order to keep their establishment in operation that now presses so heavily on Devon Great Consols, and removes them from the position of our greatest dividend mine to that of a speculative concern making heavy calls.

It has been very extensively rumoured that the shares in the Tharsis Company are in much fewer hands than some of the larger holders would wish, and it cannot be doubted that the offering of the shares of an equally well situated rival company at par must seriously affect the position of those who are depending upon 300 per cent. premium, but this circumstance alone is scarcely sufficient to justify the expenditure of corporate funds to circularise an entire body of shareholders. Mr. William Henderson, of the St. Rollox Chemical Works, himself an employee of the Tharsis Company, stigmatises the circular of the secretary—Mr. Jonathon Thomson—as "a mistake;" and he could not have defined it more accurately, except by stating that it is full of mistakes. The Tharsis Company has a capital of 1,000,000*l.* it is true, but at the present quotation for the shares, and considering the fact that the capitalisation of the royalties must be provided for, fair dividends upon fully 6,000,000*l.* must be earned before present investors could be paid reasonable interest upon their investments; and as 6,000,000*l.* is about the amount which Mr. Jonathan Thomson considers the Rio Tinto Company would have to pay dividends upon, it would seem that if the size of the Rio Tinto property were reduced to that of the Tharsis the commercial prospects of the two concerns would be about equal. But the most important point appears to be the demand which can be secured for the mineral. If the Rio Tinto can bring into the market more than sufficient to supply the entire trade, the offering of 250,000 tons per annum by the Tharsis Company would be disadvantageous, and even the fact of the Tharsis Company losing 3*s.* per ton upon their aggregate sales would be of no benefit to the Rio Tinto shareholders; the competition could scarcely fail to force down prices, and even the greater advantages of the Tinto Company, in the shape of a more cheaply worked railway and more easily wrought mineral deposit would not entirely overcome the difficulty.

Much stress is laid by the Tharsis officials upsn the large and costly metal works at home which their principals possess, but the fact must not be lost sight of that precisely similar works could now be constructed for less money than has been expended upon the Tharsis works, and that in constructing fresh works now "continued mistakes" and "notorious bungling," which Mr. W. Henderson states are to be credited to the Tharsis board, might be avoided. Mr. Henderson thinks that the object of the vendors of the Rio Tinto property was to induce the public to relieve them of the responsibility they had undertaken; yet it can scarcely be supposed that a firm of the high commercial standing of Messrs. Matheson would pay the sum of 374,000*l.* out of pocket, and incur an additional 3,000,000*l.* of responsibility, upon the slender chance of the public coming to their assistance; the more reasonable conclusion appears to be that they have ascertained that there is no serious danger in risking the liability, although they are ready to reduce it by offering a proportion of the interest to the public, provided they can do so at a profit. Had the firm dreaded the liability they had undertaken, they would doubtless have offered a discount, instead of demanding a premium, in order to be relieved of it. The question of the price of the ore is one which will equally affect both companies, except that the Rio Tinto, which can almost drop the mineral from the lode into the railway trucks, and then ship it without breaking bulk, will have an advantage which cannot be claimed where every ton has to be hauled to the surface, and then carried over a badly graded railroad to the place of shipment.

FULLER'S AURIFEROUS QUARTZ REEF, IN NEW SOUTH WALES.

In the Supplement to the *Mining Journal* of June 14 a letter was published from our old correspondent, Mr. John Walker, the colonial and foreign mining machinery manufacturer, of James-street, in which he referred to having obtained (by the aid of stamping and amalgamating machinery, which he was about to deliver for practical use upon a mine) some very large yields of gold from several samples of quartz submitted to him by gentlemen interested in a property to be brought before British capitalists. It now appears that the source of the quartz was the property now in the hands of the FULLER'S REEF GOLD MINING COMPANY, which has just been incorporated with a capital of 150,000*l.*, in shares of 10*l.* each. As the mine which the company proposes to work is the adjoining section of the "Jeweller's Shop" (so named on account of its richness) the value of the locality need not be commented upon, but it may be mentioned that the "present workings," embrace the Deep shaft (No. 1) yielding 8 ozs. of gold to the ton, and the Ladder shaft (No. 2) yielding 5 ozs. to the ton, whilst No. 3 shaft, the last quartz from which yielded 2½ ozs. of gold to the ton, is not being worked, because it is not considered sufficiently rich. It is explained that the quartz reefs in Australia are considered by geologists as entirely different in their formation from anything known in other countries. Their existence can generally be traced on the surface for miles; they vary from 2 to 6 ft. in width, and present the appearance of a deep massive wall constructed in the earth, whose depth no one has hitherto fathomed, and requiring generations to exhaust even a few hundred yards. Gold is always found more or less from the surface downwards, but the deeper the sinking the late crushings have proved, the richer the yield.

The samples worked by Mr. John Walker yielded of gold 30 and 280 ozs. respectively, and the assays of two large samples by Messrs. Johnson and Son show that a selected sample of 8 lbs. 10 ozs. averaged 173 ozs. of gold and 34½ ozs. of silver to the ton of 20 cwt., and that a bag of quartz 22½ lbs. in weight gave 23½ ozs. of gold and 5½ ozs. of silver to the ton. Whilst engaged as Chief Commissioner of Roads in New South Wales Mr. W. R. Collett personally obtained some mundic quartz from the Fuller's Reef, and upon having it assayed at the Sydney Royal Mint he found it to contain pure gold at the rate of 1220 ozs. 2 dwts. to the ton; and he now writes that he is prepared to testify to the great richness and value of Fuller's Reef, as 950 tons crushed during his residence in the district produced more than 2000 ozs. of gold, and that in more recent deep workings the lode has materially increased in value. This testimony is the more valuable as Mr. Collett had unusual facilities for studying the geological character of the reef during his official service in New South Wales, whilst carefully surveying the mountain pass and carrying out the new line of road from Aberdeen to Mooman. The Fuller's Reef, in the Denison gold field, by which name the company's property is called, has been thoroughly established, and the Gold Commissioner for the Crown, who is also Stipendiary Magistrate for the district, writes, in reply to enquiries, that the quartz reef is very inexpensive to work, and he believes only requires capital and good management to secure a splendid return for those who invest money in it; and he adds that any company purchasing the gold workings of Fuller's Reef will be put in possession of a return for their investment from the day of transfer. The company acquire the whole of the mines, plant, freehold lands, buildings, machinery newly erected, and the leasehold from the Crown for 60,000*l.* in cash and 70,000*l.* in fully-paid shares. The crushing operations have been delayed during the past four months in consequence of the necessity which existed for completing a long adit of 700 ft., which thoroughly drains a large section of the mine, but this has now been accomplished, and the latest telegram says—"Struck first-class stone in long tunnel, 700 ft. in, 500 ft. from surface, showing gold thickly."

The reports of the professional surveyors—Messrs. Waters and Holman—are highly encouraging. Mr. Holman, after giving a flattering account of the mine, states that ample water-power can be made available for crushing up to 400 tons or more weekly, and Mr. Waters considers it will be a most profitable mine, and will yield very large averages of gold occasionally, as strikes of ore are cut into; all this, he continues, will be in addition to the hitherto established average of 1 oz. 13 dwts. to the ton. Taking the estimate at only 300 tons per week, worth 6*l.* per ton, and working but 48 weeks in the year, and allowing 1*l.* per ton to cover working expenses and superintendence, the profit would amount to 72,000*l.* per annum, or sufficient to return the entire capital in little more than two years; but, inasmuch as during Mr. Holman's visit 21 tons of stone were cleaned up, and yielded over 5 ozs. per ton, it is not unreasonable to anticipate that this estimate will be largely exceeded. The prospectus will be found in another column.

TECHNICAL EDUCATION IN GERMANY.

Reference was last year made in the *Mining Journal* to the inauguration of the Royal Rhenish Westphalian Polytechnic School at Aix-la-Chapelle, and from the new Programme for 1873-4, just issued, all connected with the establishment may fairly be congratulated upon the large amount of success which has attended the School during so early a period of its existence. For the first session of 1872-3 no less than 373 persons availed themselves of the teaching offered by the School, comprising 311 ordinary and 40 occasional students, and 22 "Hospitanten," including 10 elementary teachers in Aix-la-Chapelle and Burtscheid, and one female. In the second session this number was increased by 27, raising the total to 400. Of the 375 belonging to the two classes of students Prussia sent 269; the other provinces of the German Empire, 45; Holland, 16; Hungary, 9; Belgium, 7; Russia, 6; Luxembourgh and North America, 5 each; Austria, 4; France and Italy, 2 each; and England, Norway, Poland, South America, and Spain, 1 each. As to the class to which the students belong, the parents of them are shown to be—officials, 105; merchants, 68; artizans, 59; manufacturers, 55; capitalists, 28; proprietors of land, mines, and smelting-works, 26; agriculturists, 17; physicians, 11; bankers, 3; and innkeepers, 1. The average age of the students is 21¼ years, there are 2 of 17 years old, and 12 above 25 years. There are 78 classes in operation, the most largely attended being those of building construction, 148 students; mechanics, first section, 131; higher mathematics, 129; elements of chemistry, 111. The fees for attendance are fixed at so low a rate that the advantages of the School are placed within the reach of all who are likely to be able to profit by the course of instruction there obtainable, and it is probably to this that the success already alluded to may be attributed. From the manner in which the studies are arranged to suit the wants of every class of students it would be somewhat difficult to state the exact amount which each would have to pay, but the example given in the Programme will suffice to give an idea—for attendance at the 41 classes comprised in the first course laid down for students preparing for the profession of architects the aggregate fees payable amount to 24 thr. 20 sg., or less than 3*l.* 13*s.* 6*d.*, the fees for the classes included in the summer course being proportionally lower. The fees for taking part in the practical exercises in the chemical laboratory, or for laboratory practice as it would be called in this country, is 15 thr., or but little more than 2*l.* 2*s.* per annum, and for a similar privilege in the physical laboratory 5 thr. per annum.

The course of instruction obtainable in the Royal Rhenish Westphalian Polytechnic School is as complete as could be desired, and from the known ability of the professors, and the attention which has been paid to make such regulations as shall ensure strict discipline in the School, it may safely be anticipated that its graduates will be as much sought after where sound practical ability is required, in connection with general industrial pursuits, as are those of the Freiberg School of Mines, Royal School of Mines, London, or

Columbia College School of Mines, New York, are already sought for by mining capitalists. The first examination for the diplomas, which are to be for architects, civil engineers, mechanical engineers, technical chemists, metallurgical engineers, and surveyors respectively, will take place in October of the present year, and we trust that hereafter more than one Englishman will take his place among the competitors for so high a distinction as the diploma of the School will represent.

PNEUMATIC ORE CLEANER.—An improved ore cleaner has been invented by Mr. J. H. HILLMAN, of Trigg Furnace, Kentucky, U.S. The ore, crushed by a Blake's stone-breaker, is delivered into elevator buckets and discharged through a hopper into a revolving cylinder, where it is carried up by means of strips or shelves secured to the inside of the cylinder and dropped through its diameter, thereby keeping up a shower of ore within. The cylinder being inclined causes the ore to approach the open end every time it is dropped, until it is discharged into the spout, thence into the barrow or the opposite side, as desired. But while the ore is being showered through the diameter of the cylinder, as described by its rotary motion, the exhaust fan keeps up a strong current of dry air through the cylinder and falling ore, carrying with it all the dirt or light material with which the ore is mixed, and discharges it at the end of the pipe, leaving the ore clean and dry. The apparatus has given great satisfaction for cleaning iron ore, and it is confidently believed that it will prove equally valuable for ores of all descriptions.

Meetings of Public Companies.

LONDON AND CALIFORNIA MINING COMPANY.

The fourth ordinary general meeting of shareholders was held at the Cannon-street Hotel, on Thursday,

Mr. LEWIS R. PRICE in the chair.

Mr. J. SAUL (the secretary) read the notice convening the meeting.

The report of the directors stated that the loss for the past six months was 11,837*l.* 15s., which, added to the loss of the preceding half-year of 3212*l.* 1s., makes a total loss to the company since the commencement of its operations of 15,049*l.* 16s. Although such a result was foreshadowed in their last report, it was hoped that the ore discovered in the original Amador Mine, a small portion of which had been milled, and yielded over $22 per ton, would have contributed more largely than it has done to the current expenses of the mine. The prosperity of both the Amador and Erie Mines seems from Mr. Hague's reports to depend rather on what may be reached in depth than on what may be discovered in the upper workings. It was explained in the last report that considerable outlay would have to be made at the original Amador Mine for hoisting works, and at the Erie Mine for hoisting and pumping works, which have been constructed, and are now in active and successful operation. The cost of the original Amador Works will be $15,992·83, of which an amount of $13,417·43 has been already paid, while the outlay on the Erie Works will be $2,544·57, of which there remains to be paid $691·10. The amounts remaining available for the development of the mines are as follows:—Cash in hands of agents on May 31 (the date of the latest accounts received), $12,624·26—2525*l.*; balance at company's bankers, July 1, 1758*l.*; balance of Mr. Coulter's loan to company, 15,000*l.*; unpaid calls available when required, 3000*l.*: making a total of 22,283*l.* At the present rate of monthly expenditure this amount will enable the works of exploration to be carried on for another year; but, as it is almost certain that some amount of bullion will be received as the operations advance, the period named may be regarded as capable of extension should the necessity for it arise. The amount of bullion produced by the three mines to the end of May this year has been $22,548·13—4509*l.* 12s. 6d. Messrs. Cross and Co. (the company's agents in San Francisco) write that during the past six months little has been accomplished beyond preparing the mines for a thorough system of prospecting, but they trust the operations they are now in a position to carry out will ere long result in satisfactory developments: and the past history of the mines certainly offers great encouragement that rich deposits will be found, and the outlay hereafter to be incurred will be reduced to the ordinary mining expenses.

The CHAIRMAN said that at the last meeting it had been fully ascertained that the reserves supposed to be purchased in the Erie and Amador Mines had no existence except in the reports, and that their future hopes were in the development of the mines in depth. The mines on either side of the Amador were both productive, the Keystone having produced large sums for many year, and the Bunker Hill was coming into a remunerative position; therefore, they were in hopes that, as in those two mines, when the unproductive part of the Mother Lode had been passed through the same valuable ground would be met with, at least in the Amador. The Erie they were not so certain about, it being filled with water, and before the bottom could be reached expensive hoisting and pumping apparatus had to be erected. The same apparatus had to be erected at the Amador to enable them to sink to a considerable depth. All this occured at a time when the capital had been exhausted. Mr. Coulter, however, came forward, and offered to lend 20,000*l.*, to enable the company to prosecute the works. That was the position of affairs at the time of the last meeting. It would be recollected what Mr. Hague had suggested as to the probabilities at the bottom of the Erie Mine, which judging by the reports of the agents, seemed likely to be confirmed. The mine had considerably improved, and the ore produced was of better quality, and the general prospects more encouraging. In another letter it was stated that the indications led to the belief that they were merely on the top of a shoot; therefore, they were in hopes that in depth the shoot would open out to a greater expanse. This, however, had not been the case. The yield of the mines during the six months had amounted to 3600*l.*, leaving the balance of expenditure upwards of 11,000*l.* Under these circumstances it was impossible for them to go on with the three mines without exhausting their disposable funds. The directors had, therefore, suggested that the agent should examine the mines carefully, with the view of determining which offered the best prospect of early returns, and temporarily suspending operations at the other mines that did not offer any immediate prospect of benefit. The result had been that Mr. Johns, who is their manager at the Amador Mine, a man well known in California for his integrity, and as an expert and a miner, had examined the mines, and the result of his visit, as they had been informed by telegram, was that he recommended the suspension for the time of the Erie and Pennsylvania, and to devote the whole of the funds to the prosecution of the works at Amador. A telegram was received yesterday to the following effect:—"Erie nothing new; prospects very discouraging. Pennsylvania shaft down 100 ft.; starting new level; prospects poor. Amador running 10 stamps on fair ore from gulch and main shafts—latter down 200 ft.; starting level to prove ledge; ground more favourable, and future prospects encouraging." Their hopes had been that satisfactory results would be found in depth, so it was encouraging to know the prospects were improving. The shaft at Amador had been sunk on the incline vein, but at a certain depth the vein went off flatter. It was certainly a favourable indication that fair ore was found at that depth, because they were not yet out of the disturbed region. A level had been driven north for a considerable distance, but another shaft was now required for ventilation. Some small old shafts had been found, and in one, which was being cleared, the ore found would certainly contribute towards the working expenses. The good ore in the "gulch" was not likely to last, because it was above the disturbed region, but it would aid enormously to the development of the mine by diminishing the expenditure. It was clear to the directors if they allowed the resources of the company to be frittered away by working the three mines they would never achieve anything; they, therefore, hoped the shareholders would approve of the intention to close the Erie and Pennsylvania Mines temporarily, and appropriate the whole of the capital and force to the Amador. It could hardly be expected that in six months greater progress could have been made, because it had always been evident that the upper works of the mines did not contain any pay ore, and that their hopes were in depth. The necessary depth, it was calculated, would be reached in about 20 months at the Amador Mine. The rate of sinking was shown by what had been achieved during the past six months—200 ft. The shaft was now 500 ft. deep, and the depth proposed to be attained was 700 ft.; therefore they might hope that before another six months have passed the necessary depth would be reached and the vein tested. He believed the agents were using every exertion to push forward the works, and try to make the mine profitable; and if things went on more prosperously they might re-open those mines at which they now proposed to suspend operations. The directors could only express their extreme regret that they were not in a position to present a more favourable report, but it could scarcely be expected that in six months the necessary works could have made greater progress. It had occurred to the board that they might have the assistance of two or three shareholders to confer with them upon some points which could not exactly be entered upon in a public meeting. All he could say was that the board were doing all they could to promote the interests of the company. When mines were not productive it was distressing not only to the shareholders, who lose their money, but more especially to the board, who lose their money also, and to a greater extent than the shareholders, because they felt a moral responsibility which affected them more deeply. They always felt very grateful to the shareholders for the kind way in which they had always been treated by them. (Hear, hear.) He then moved that the report and balance-sheet be received and adopted.

Mr. T. S. NEALL seconded the proposition, which was put, and carried unanimously, without any discussion.

The retiring directors were re-elected. A vote of thanks was passed to the Chairman and directors.

The CHAIRMAN, having acknowledged the vote, hoped to be able to present a more favourable report at the next meeting.—The proceeding then closed.

UTAH SILVER-LEAD MINING COMPANY.

The statutory meeting of shareholders was held at the offices, Austinfriars, on Monday,—Mr. GEORGE BATTERS in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said the affairs of the old company had been very nearly closed. There were still a few shares to be arranged; but the whole of the shares rejected by the old shareholders—that is, those who had taken money instead of shares—had been applied for, so that the whole of the capital of the new company had been secured. They were all aware of the causes which brought the old company to grief, and the basis of its resuscitation; and he might say that everything had been carried out with the strongest desire on the part of the directors and also their solicitor, Mr. Snell—who had been mainly instrumental in bringing about the resuscitation—to secure the right to the shareholders in the old company to come into the new company. One great reason was that many, having paid a very high price for their shares, and the directors believing there was every prospect of the company working round to a successful issue, they should not be deprived of the privilege of participating in the results. With regard to the new company, he had really very little to say, except that immediate action had been taken as to the management in Utah—Mr. Bateman had been given absolute power to inaugurate the kind of management which the shareholders wished to be carried out, so that henceforth the enterprise would be conducted exclusively as a mining undertaking, and not as a mining and smelting company; that the ores should be dressed and an experiment made whether those ores could be sold at a profit in the country, and, if not, shipped to England, provided a profit could thus be ensured. Mr. Bateman had manifested his faith in the new company by at once becoming the largest shareholder, and subscribing 2000*l.* in actual money. The directors had sought to secure the services of a reliable resident secretary, inasmuch as Mr. Eagle, who was connected with the old company, had signified his intention to resign. They had secured the services of Mr. Argall, who was well known to one of the directors, Mr. Burnand; they had also succeeded in securing the services of Mr. Longmaid, who had been in Servia for many years, and was throughly acquainted with mining, and also with dressing and smelting of ores. He (the Chairman) had known Mr. Longmaid for the last twenty years, and he was in every respect a most desirable man to obtain. Previous to his departure Mr. Longmaid had fully acquainted himself with the necessary machinery required for the successful and economic dressing of the ore. From the information the board had received the lead ore already discovered was apparently, if not inexhaustible, in such large quantities that all they need trouble themselves about was the most efficient means to dress it, and the best market in which to sell it. For the months of May and June—the first two months of the present company's existence—the management talked of sampling enough ore to pay every expense—that is, the expense of unwatering, opening, and working the mines had been met by the sale of the crude ore, without having dressing machinery. Had it been dressed up to 70 or 80 per cent. they would have been able to sell it at a very high price. The board had no necessity to make a call, although it would be remembered there was 1*l.* per share uncalled up; there was 1000*l.* in the bank, and there was yet a good deal of money to come in, so that the company was in a very comfortable financial position, while there was every prospect of making a very paying concern out of what threatened at one time to be a very disastrous affair. He then proceeded to read the letter just received from Mr. Argall, as follows:—

Your letters, dated May 22, and June 4, received, and contents duly noted. I herewith send accounts for the month of May. I have now had considerable opportunity of judging Mr. Rodda, and I think I may fairly congratulate the directors on the choice that Mr. Bateman has made. He is evidently a thorough miner, manages his men well, is always at work, early and late, and is all I could wish in his views of managing the mine economically: at the same time he bitterly deplores the large sums recklessly squandered upon the mine, a tithe of which, judiciously expended, would have thoroughly developed the mine. Mr. Bateman's ideas of the powers that a superintendent ought to have differs considerably from those expressed by the directors when I was in England; but all is arranged very smoothly, and we all work very well together, so far. I draw all cheques and Rodda orders what he requires through me. I may add that I have spoken with nine or ten men who knew Rodda in California, and one and all have a high respect for his ability as a practical man; and the real business men here seem to think very little, indeed, of the opinion of a mere "professor."

ORE SALES.—I shall, of course, furnish you with an ore sales account regularly, but there is so much delay between the time that each order is filled and the assays taken and agreed on that I can only say at present that we have sold and received as under:—Dr. Smith, 100 tons, at $18 per ton; Saturn Smelting Company, 50 tons, at $13 per ton; Robbins Smelting Company, 50 tons, at $19 per ton. We have shipped besides some 300 tons to different firms, whose assays and remittance will, I think, come to hand in a day or two. All these sales were made to be delivered at Sandy in cars, we paying freight to Sandy. Mr. Rodda estimates the cost of raising, assorting, and sacking our ore at about $8 per ton. The mine generally is looking about the same as at last advices, and Mr. Rodda will write you fully on this head to-morrow.

JIGGERS.—We are utterly at a loss to understand why men have not been sent out to work the jiggers, and Rodda at length set them up after his own idea, and having crushed some ore, set them going. The result was, however, not very successful, and he will give you his opinion when he writes. One thing, however, is quite certain, that jiggers of some sort are to us a matter of the very last importance, and should be considered without delay. It is positively throwing away money to wait. There is upwards of 700 tons of the second-class ore on the dump now, and any amount to be had; and had the jiggers been able to work during the last two months, we would have had reason to be proud of our bank-book. Rodda does not doubt that jiggers could be got out here to work the ore easily, and if you do not intend to send men out I would beg you to authorise us to act here, and be certain of the result. The higher grade ore will take care of itself, but we could always be making money if we only had proper jiggers at work. Once more let me entreat that no more time may be lost in this matter. I will write again in a few days.

It must be highly satisfactory to find that their resident secretary speaks so highly of the position of the mine and its prospects: their prospects for early profits were now of a more assured kind than ever they had been since the existence of even the old company.

A SHAREHOLDER asked the value of the ore referred to in Mr. Argalls' letter as having been sold at $19—that is, after it had been dressed?—The CHAIRMAN said if dressed up to 45 or 50 per cent. of lead it should realise $80 per ton, and instead of 8*l.* it ought to realise 20*l.* per ton. It would be worth that in this country: and was at least of equal value in Utah. Silver and gold were, of course, always worth their standard value. The ore dressed up to 80 per cent. would contain about 24 ozs. of silver. If the ore could be dressed at 16s. per ton a very handsome profit will be realised. He had omitted to mention that he had seen a private letter from Utah, in which it was stated that the mines of this company were very rich, and had every prospect of proving a great success. He had also seen a young gentleman connected with the Government School of Mines, who had just returned from Utah, and he also had given additional evidence as to the deposit of galena ore in these mines.

Messrs. G. Batters, J. C. Bateman, W. H. Burnand, J. Carr, and E. Applegarth were re-elected directors.

The CHAIRMAN, referring to Mr. J. P. Sewell, stated that his accession to the board would be of great practical value, that gentleman having been for many years connected with the well-known Real del Monte Mines. He also mentioned that the board had not received any fees, but when large profits were being made they would, of course, expect to be remunerated for their services. (Hear, hear.)

Mr. LAKE was strongly of opinion the directors should be paid whether profits were being realised or not.

Mr. SEWELL, as a new shareholder, should like to ask whether the engines on the mines, as well as the other property and the mines themselves, had been transferred to the present company?—The CHAIRMAN: Everything.

Mr. SEWELL said it was indeed a cheap bargain, and those who could come into such a mining business ought to be well satisfied. All that had been done up to the present time were the merest scratchings, but they had proved that much larger bodies of ore would be found in depth. One important point was the reaching of the Belshazzar lode—that would be done at only about 30 ft. deeper, where there was no doubt a richer class of ore would be found than any yet discovered.

The CHAIRMAN said that very little actual mining work had been done, but that little had discovered one of the largest deposits of galena ever known; at least he did not know a greater deposit.

A vote of thanks to the Chairman was passed.

The CHAIRMAN having appropriately acknowledged the vote, reiterated his opinion that there was every prospect of working this concern round to a successful issue.—The meeting then separated.

VAN CONSOLS LEAD AND BARYTES MINING COMPANY.

An extraordinary general meeting of shareholders was held at the London Tavern, on Monday, for the purpose of confirming the following special resolutions passed at the meeting held on July 2—"That this meeting, having taken into consideration the advisability of issuing 2000 reserved shares, and deeming that the same should be issued, hereby resolve that the said 2000 shares be issued to the persons holding shares in the company on this date, in proportion to their respective holdings, at the price of 5*l.* for every share. That the 5*l.* per share be paid for as follows:—1*l.* per share on application, 1*l.* per share on allotment, 1*l.* 10s. per share three months from date of allotment, and 1*l.* 10s. per share six months from date of allotment. That all shareholders not taking up their quota of these shares within the time to be prescribed for so doing do lose all right and title to the same, and that such shares be left in the hands of the directors for disposal for the benefit of the company."

Mr. MATTHEW GREENE was voted to the chair.

The CHAIRMAN said the notice convening the meeting sufficiently indicated its object. At the meeting held on the mine on July 2, to which the shareholders were invited to attend to see for themselves the truth of the statements made by the manager as to the satisfactory position into which the mine had been brought, it was unanimously decided that the 2000 reserved shares should be issued. The proposition, which emanated from the directors, had been conceived quite in the true and permanent interests of the shareholders. The mine, it must be remembered, was a very extensive property; the original capital was only 45,000*l.*, and he had no hesitation in saying that the ore already discovered was at least fully equal to the entire capital of the company, which he contended was properly applicable to the purposes of dividend. The directors did not think the present shareholders should have their dividends appropriated to the further development of their mine, which consisted of half-a-mile of unexplored ground, because—if for no other reason—such an expenditure was properly and legally chargeable to capital. To show his confidence in the soundness of the policy the board was advocating, and also in the intrinsic value of the mine, he was willing to take one-half of the 2000 shares now proposed to be issued. The prospects of the mine had considerably improved since the last meeting, and especially during the last few days. He had the satisfaction of announcing that tenders had been received for 100 tons of ore at 14*l.* 15s. per ton, which, considering it was their first sale, was a very good price, and had it been in the market six weeks earlier it would have realised 1*l.* 5s. more per ton. The improved prospects of the mine were fully referred to in the report received that morning, which was as follows:—

July 19.—Since the meeting of shareholders, held on the mine on the 2nd inst., we have been continuing our operations both at surface and underground vigorously. Two days since we discovered the main part of the lode in the 75 fathom level that had been heaved south by the influence of a band of gritstone. It is now producing cubes of lead, and as it approaches the junction of the north lode we may expect important discoveries of ore. In extending the 45 east we have been constantly finding detached stones and branches of ore, associated with carbonate of barytes of the finest description; therefore, I am daily expecting to enter into a permanent deposit of lead ore. The section of workings which I send you by this mail will show the exact position of the 60, with the ore now being wrought on under the 45 fm. level. The rise 65 fms. west of end is worth 10*l.* per fathom for lead ore. The new winze nearest the 60 end is in a good lode of ore, to-day worth 2½ tons per fathom, and likely to improve. The winze east of ditto, now 4½ fms. deep, is also worth 2½ tons of ore per fathom. During the last two or three days the 45 east, which is being extended into virgin ground, has greatly improved; the lode now consists of slate, containing large stones of ore, enveloped in blende, and carbonates of barytes. We brought splendid specimens of ore from the forebreast to-day, and from appearances one would say we are on the eve of entering into an extensive course of lead ore. I may add it is to-day giving us a ton of solid lead per fathom. The 25 east is also entering a beautiful channel of ground, and I consider the lode is of much greater promise than when last reported upon. The stopes are without material alteration, except that over the 35 fathom level, west of rise, which has slightly improved. We are bringing ore to surface, and dressing as rapidly as possible. Machinery all in good order, and working well.—JAMES ROACH.

Having stated that he purchased the mine some years since, and that the important points now being attained he had been looking forward to for a long time past, he proposed that the special resolutions embodied in the notice convening the meeting, and passed on July 2, be now and are hereby confirmed.—Mr. HAYWARD and Mr. WILLIAM WARD (Stock Exchange) supported the proposition.

The CHAIRMAN, in reply to questions, stated that the contractors had undertaken to complete the dressing-floors by March, but they were not completed till June 17. Everything was now in full work, and there was at surface 300 tons of ore. They fully expected to sell 100 tons per month. The balance sheet submitted at the recent general meeting showed assets 9190*l.*; but, had the reserves and machinery been valued, the assets would have probably amounted to 90,000*l.* The directors proposed before the next meeting to have the whole of the plant valued, and placed in the balance-sheet. By means of the capital subscribed upon these 2000 shares the directors would be able to work the eastern portion of the mine, and from the profits upon the ore already discovered pay regular dividends. According to the present prospects of the mine, the returns might be calculated at 100 tons per month, which would leave a monthly profit of 1000*l.* The fact of the 45 end east coming again into lead made the shares worth at least 50 per cent. more. In truth, its importance could not be over-valued, the 45 east being the pioneer level.

The resolutions were then put *seriatim*, and unanimously confirmed. A vote of thanks to the Chairman closed the proceedings.

GREAT WHEAL BUSY MINING COMPANY.

A special meeting was held at the mine, on Wednesday, for the purpose of taking into consideration the future prosecution of the mine or otherwise. There was a large attendance of shareholders, considerable importance being attached to the result of the meeting, which proved unfavourable to any further working. Mr. JOHN JOSE (the purser) took the chair, and stated that altogether 555 shares had been relinquished up to the present time, and that it rested with the adventurers whether they should continue working or not. He then read some extracts from a report of a meeting held just previous to the last suspension in 1868, from which it appeared that the reserves of tin ground had been estimated by Captains Dawe, Michell, Teague, and Michell, at from 70,000*l.* to 80,000*l.*, and they were thus raising 5000 tons of tinstuff per month. Under these promising features Lean, Jose, and Co. took up the mine, but shortly afterwards Mr. Samuel Lean died, and his widow's solicitor requested Capt. William Rich, who was formerly manager there, to report on the prospects of the mine. Capt. Rich said in his report that in the last working 22,000*l.* worth of ore had been raised per year, but tin being then only 43*l.* per ton there was a loss on the working, but with tin at the present price it would leave a profit of 12,000*l.* per year. Mrs. Lean was very willing to carry on her shares provided the relinquished shares were taken up, but unless that were done she would have nothing more to do with the concern. Since the last meeting he (the Chairman) had written to several friends in London with a view to get the shares taken up, but he was sorry to say that they had replied that, owing to the unsettled state of the metal market and the high price of materials, they could not see their way clear to doing so.

Mr. PHILIP BLAMEY thought it was a great pity to give up the mine just as they had accomplished the heaviest part of the work. Now that the golden eggs were almost in view they were going to shrink from the task.—The PURSER remarked that they knew their position, and if the relinquished shares were not taken up there could be no hope of further working. It was useless going on adjourning the meeting; if they intended to work, then it were better to work with a will, and fork the water out.

Capt. GOOCH asked what would be the probable cost of forking the water?—The PURSER: From 20,000*l.* to 25,000*l.*—Captain GOOGH said he was willing to double his interest: and altogether ridiculed the idea of being frightened at a stray paragraph or so in the papers.

It was then suggested that each shareholder present be asked how many additional shares he would take with a view to make up the requisite number, but only 104 were taken up, so that this effort proved of little avail.

After some further discussion, in which Messrs. BLAMEY and ELFORD strongly advised the propriety of calling another meeting to give absent shareholders a chance of increasing their interest, it became evident that such a course would be utterly useless, especially as Mr. Thomas Michell said he could tell them on the best authority that 400 shares more would shortly be relinquished.

Mr. JOHN HOCKING, jun., proposed, and Mr. WILLIAM MICHELL seconded, the following resolution:—"That the mine and materials be offered as a going concern, and that a special meeting be held on Monday, Aug. 11, to confirm the same, and in the event of their not being sold, that they be offered to the lord, and if refused by him that the purser be instructed to offer the same by public auction or private contract, as he may see fit."

[For remainder of Meetings see to-day's Journal.]

MILNE v HOLMES.—This case was tried in the Lord Mayor's Court before a special jury. The plaintiff, a colliery agent, &c., sued for 700*l.*, due to him for promoting a gas company for lighting the Petersburg and Viborg quarters of the City of St. Petersburg. Mr. Salter and Mr. Cox appeared for plaintiff; Mr. Kemp and Mr. Clare for defendent. The defendant was to be contractor for the company, which the plaintiff had been instrumental in floating. The defendant had differences with the company which resulted in a Chancery suit. According to the evidence of Mr. Learoyd, who acted as solicitor for the defendant, it was arranged that 2100*l.* should be paid to Mr. Holmes by the company in settlement of their dispute, which sum (less 700*l.* attached in this court by the plaintiff) was actually paid to the Midland Banking Company, the bankers of the defendant. Mr. Mellor, who was engineer to the company, stated that it was ex-

pressly stipulated that if this sum was paid it should include all claims by the present plaintiff in connection with the above company, and it was accordingly arranged that he was to have 700*l.*, the sum he now sought to recover. There are other transactions in dispute between the parties, and the case was stopped by an arrangement for reference to an arbitrator, in whose discretion the costs were left, a verdict for the plaintiff as to the 700*l.* being taken subject to this reference.

THE EMMA SILVER MINING COMPANY.

Preliminary report of the committee appointed by the shareholders on June 11 to confer with the directors on the present position of the mine and its future prospects:—

The committee met the directors on June 18, and since that date have held frequent consultations with them. The attention of the committee was directed, in the first place, to the causes which led to the resignation of Mr. Archibald Orr Ewing and Mr. Henderson as directors. The whole of the correspondence, which is very voluminous, was attentively perused by the committee. From this it appears that the resignation of Mr. Archibald Orr Ewing was mainly due to his dissatisfaction with the way in which the affairs of the company had been managed, combined with a personal misunderstanding with Mr. Anderson, the Chairman of the company. As soon as they were acquainted with Mr. Archibald Orr Ewing's views the directors offered him the chairmanship, and the committee cannot but regret that under the circumstances he should still have thought it necessary to tender his resignation. Mr. Henderson resigned his seat at the board in consequence of the resignation of Mr. Archibald Orr Ewing, and Sir Henry Selwin Ibbetson resigned because he believed that the board, when deprived of the services of Mr. Archibald Orr Ewing and Mr. Henderson, would no longer possess the confidence of the shareholders. The report received from Mr. Attwood, the superintend of the mine, have all been duly considered. They appear to be fairly and honestly framed, and the committee consider that the directors are justified in their confidence in Mr. Attwood. These reports, since the publication of the first on April 21, 1873, have been uniformly of the same tenour, and have been confirmed by reports from Mr. Clarence King and Mr. Blackwell, gentlemen of great experience in mining matters. The present expenses of the mine continued to be paid by the second-class ore on the dump, by the discovery of small quantities of rich ore in the caved part of the mine, and by the remaining quantity of ore in the stopes and in the bottom part of the mine. Mr. Attwood intimates that he will still be able for some time to pay the working expenses of the mine, but his exploration has been much impeded by water in the lower part of the mine from the melting of the snow. The present pump is not property adapted for mining purposes, but being the only one immediately procurable it has probably saved the mine from a repetition of the disaster of last year. The latest accounts state that the water was subsiding, and the latest advices from Mr. Attwood are more encouraging. The future of the mine mainly depends upon the result of adequate explorations, the greater part of the property of the company remaining still unexplored. With the approval of the conference, negociations have been opened by the directors for the purpose of determining the best course to be pursued towards prosecuting future explorations in the mine. The result will be made known in a future report, and will also guide the committee in the recommendations which they will then make to the shareholders. The committee think it right to add that although there have been errors in judgment and disasters since the commencement of the business of the company, yet nothing has transpired during this conference which should shake the confidence of the shareholders in the integrity of the directors.

R. B. McCREA.	P. N. BERNARD.
JOHN WOOD.	JAMES MACFARLANE.
ARCHIBALD ORR EWING.	ROBERT T. CLEMENTS
T. A. L. MURRAY.	HENRY SELWIN IBBETSON.

The above signatures embrace the names of all the members of the committee who have attended the meetings of the conference.

FOREIGN MINES.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada:—Week's run 845,000. All going well. New furnace commenced.

WINAMUCK (Silver).—Telegram: Nineteen days $15,000; one furnace running.

FLAGSTAFF (Silver).—Telegram: Ore realised 4900*l.*—Maxwell.

LAST CHANCE (Silver).—A telegram from the manager of the mine states that the furnaces are now running.

BIRDSEYE CREEK (Gold).—G. S. Powers, June 30: The contractors completed their 400 feet the 28th instant, and it was a perfect success, being on a true line with grade, and everything complete. There yet remains 90 feet to complete the first survey, where I purpose to raise shaft and commence washing. The water is holding out much better than I expected, and I have at present enough to keep up Uncle Sam one head, which is the only claim washing since the 20th inst. I hope to make nearly current expenses from Uncle Sam washing, and clearing up ground sluices to make the connection with next water season, or very nearly.

COLORADO TERRIBLE LODE.—Ore raised during the month of May: First-class, 9 tons, value per ton $700=$6300; second-class, 20 tons, value per ton $120=$2400; third-class, 94 tons, value per ton $30=$2880; third-class rock, 60 tons, value per ton, $10=$600; total, $12,180.—Month's Expenses: Management, $353·07; mining cost, $34·6; ore, second-class, construction, &c., $818·78; supplies, sundries, and teamster, $373 15=$1911; leaving credit balance of $7169. [The debenture bonds which, became due on April 30, amounting to 1900*l.*, have been paid with interest.]

BASYE CONSOLIDATED (Silver).—Telegram from the company's special agent at Nevada:—I am perfectly satisfied with the mill. The mill ought to be started on custom ore at once. I can secure enough custom ore to run 15 tons daily. The prospects of the Basye Mines look well, and only require development to ensure good results. Investigating Pinto closely; full report on 26th.

ELDORADO (Nova Scotia: Gold).—Mr. T. P. Baker, C.B., one of the directors, who has just returned from visiting this mine, says:—I visited the Eldorado Gold Mine, and examined it carefully below ground, and according to my judgment it promises well for the future. On the principal, or Plough, vein there appears to me quartz in abundance for months. The shaft has again been sunk 3 ft., showing rich quartz for 220 ft. in length, and from 12 to 24 ft. thick in the lode. There are several thousand tons of quartz lying at surface, which was not crushed by the former proprietors, as it was considered by them too poor, but Mr. Sprague (the manager) feels confident he can realise at least 32 net profit per ton: 30 tons have been taken from the bulk for the purpose of testing its value, Mr. Sprague informs me that the level has intersected the Mitchell veins, and that he is deepening the shaft to the level: when this is completed the tunnel will be continued west and north, to cut two veins showing free gold, and looking very promising. Crushing was suspended in the early part of June for 12 days, for the purpose of repairing machinery.—[Shareholders are informed that for nightly reports of the progress of this mine will appear regularly in the *Mining Journal*.]

SERVIAN COPPER AND IRON COMPANY.—Brenton Symons, July 12: We shall start the new water-wheel on Wednesday, and on the Saturday after we shall see the lode in the bottom of the shaft, and commence raising ore. We have no change to report in the mines. We have made a new discovery of ore under Staritza, but at present cannot estimate its value. Smelting proceeds somewhat slowly, but to-morrow we put the second blast-machine to work, when we shall smelt much more quickly. We commence to send our copper to port on Wednesday. We estimate the amount at 20 tons. Our last parcel of copper assayed 96 per cent. Our sampling last Saturday produced 277 tons of copper ore, at an average produce of over 7 per cent. The weather is now fine, and during the past week we have mowed 150 acres of hay. Grain crops good.

I. X. L. (Gold and Silver).—Mr. Chalmers writes (June 30):—We are now in the 99 from the 100 ft. level. The 100 being short 2 ft. of 100, I propose making this 102, which, with the sump for water, will make 9 ft. more to sink before we commence driving to the ledge. I cannot get our ore down to the mill. I am very anxious indeed to see the result of the operation on the poor ore on your ore dumps. Of course, we shall have to pay the ordinary rates for crushing and hauling, the balance being yours. The Schenectady Company have resumed work at their mill, so we cannot hire it. You do not require furnaces for a wet crusher. I think I can make a 20-stamp wet crushing mill put through 50 tons a day, and I think a 50 ton wet crushing mill can be put up for under 10,000*l.*

EXCHEQUER (Gold and Silver).—R. Chalmers, June 30: The engine-shaft is now down 97 ft., 5 ft. sunk last week. We have not yet tapped the ledge, but are not far from it. Seams of quartz with sulphurets indicate its proximity. From the 100 I drive on the ledge 20 ft. or so, and then commence stoping for ore.—Quartz Mill: You will be as glad to hear as I am to announce that the mill is now under way, and that everything works up to my highest anticipations so far as the machinery is concerned. I cannot yet give you the value of the ore, as it will be 12 hours before we have sand (re-crushed ore settled) to assay. Everyone who has seen the mill, amalgamators, battery feeders, &c., old hands from Virginia and Empire, are loud in their praise, and predict efficient and economical working. I intend putting on another team to-morrow or Wednesday to ensure the punctual delivery of 16 tons a day. The ore-house is full, and during the week the team has been hauling lumber for the substantial repair of all the bridges between the mill and mine, which were in a dangerous state for 5-ton wagons, the team, in fact, having gone through once or twice. I have had during the last month a great deal of outside work to do in the shape of excavation for slimes and tailings, but everything is now so arranged that it is impossible there can be any escape of silver. The battery is as solid as a rock, and will run 120 if needed. I think 90 will give me 16 tons per diem, but all this will have my careful attention during the week. My first bullion will go to pay my debts, after which prepare for dividends.—Saw Mills: I am also glad to be able to announce that your turbine (water) wheel is a complete success, driving two large saws through 4-ft. logs with perfect ease. I have been running three days steadily. A few orders coming in.

CHICAGO (Silver).—W. S. Godbe, July 5: The mine continues to develope satisfactorily, concerning which I quote from Mr. Pott's letter, just received:—"We are now down 25 ft. at the end of incline, and still pitching down fast. This morning we are fixing the windlass on the top of the shaft, and shall continue to sink on it." The engine and boiler for the smelting-works left Utica, New York, on June 25, and will probably be here within the next 10 days. Everything is in readiness for their erection immediately they arrive, and there is every probability of the works being completed by Aug. 3. Mr. Hampton has returned with the mules, the selection of which does him credit. The wagons will be here in a few days, and then we can command the most of our transportation at the lowest cost possible. In accordance with instruction, I enclose herewith the United States patent for the Chicago Mine.

GENERAL BRAZILIAN.—Capt. Thomas Treloar writes, on June 14, that the ore is improving. As to the mine, he cannot yet send gratifying news, but hopes they are not distant from something good. He has concentrated their force upon Santa Ana to lessen the risk of the company falling through before any of the shoots of gold are laid open. The watercourses will shortly have to be cleaned, not only because the water will be required, but to retain legal possession. At Santa Ana they can work but six of the twelve heads. At present the health of the establishment is satisfactory, but during May a good deal of sickness prevailed. At Itabira they have been timbering the shallow adit to make it safe before the rainy season sets in. Sketch from working plan has been forwarded.

CRESCENT (Gold).—Capt. Stetson, July 1: I have now reduced our forces to ten men, who are employed entirely about the prospecting shaft, where I still have hopes of getting some good ore. The rock in the south drift is changing every foot, and is looking more favourable; have had lode matter for 30 feet. In the first level I have a ledge about 18 in. thick that prospects very well, and think it is improving as I go on it westward; the rock which comes from it I think will pay to work.

BUNKER HILL (California).—W. L. Palmer, July 4: In my last I stated to you that, with the addition of a 20-stamps mill, we could net to our shareholders $125,000 per annum—with our first-class ore we can net $345,000 per annum. I wish you to understand that I do not refer in this last statement to such ore as our specimens have shown—$1800 to $2000 per ton, &c., some of which we have in our lowest levels—nor do I refer to the ores that run to the value of about $100 per ton, which we find more or less of in all of our levels; but I refer particularly to our milling ores. Such ore as we have worked in our mill at the upper levels has yielded on an average at a rate per ton that will give us this profit as stated above. You will also bear in mind that we have our shaft down 430 ft., and drifts running northerley and southerly from this main shaft at the following depths—viz, 70 ft., 170 ft., 230 ft., and 270 ft. We have explored the vein carefully, both north and south, by cross-cuts, winzes, &c., and the ore we have worked in the upper levels we find going down with good strength and richness, and extending indefinitely below so far as our explorations have extended, and our neighbours have proven this vein to be good over 800 ft. below our present depth.

LANESTOSA.—July 3: Asuncion: In exploratory shaft and cave we are still removing debris to open (apparently) fallen masses of orestill going forward here. In working north the cave is 12 ft. wide, and large quantities of stuff have to be removed to clear a little ore. The next stope over bottom will have less width and proportionately more ore. Signs of being near the bottom begin to appear; the estimated produce is 1 ton of lead and 3 of calamine per fm. The level north from cave is a level started to prove ground beyond north end of cave. It is passing through a mixed mass of broken rock, cemented by infiltrating water without ore.—Glanrafon: In deep adit cross cut we have now driven 7 fms. in advance of the expected line of lode without intersecting anything that can be recognised as such, and have thought it best to try one of the branches passed through. The level north from adit cross cut has been commenced on a vein of carbonate of lime and blende 1 ft. wide that was passed through in cross-cut to prove whether it be the lode sought for.—Aurora: Heavy rains prevented much being done in Zalcuine's pitch during past month, but work is now resumed, and probably a little ore will be raised (yielding ½ ton lead ore and ½ ton calamine per fm). La Flora: The men in stope in deep adit were removed to fill up at Asuncion; there is still a small branch of ore in the back.—La Berta: Guillermo shaft has just cut into a lode 3 feet wide, composed of fluor-spar and hard silicious rock, with a good scattering of lead. Presuming that this is No. 2, or principal lode, the shaft is turned from the perpendicular to be sunk with it. Sinking is very slow owing the difficult character of the rock, and the want of ability in the men for such ground. In shallow adit the rock here is extremely hard, and progress is, consequently, not good. No. 1 lode should soon be intersected, when the ground will probably improve. The raisings for the month are very uncertain, depending upon the results met with in Asuncion Cave, but I estimate it at 20 tons calamine, and 5 tons lead.

LINARES.—July 16: Pozo Ancho Mine: The lode in the 85, west of Crosby's shaft, is large and strong, but yielding no ore. In the 75, west of Crosby's shaft, the lode is small and poor. The 75, west of San Francisco shaft, is opening good paying ground, yielding 2 tons of ore per fathom. The lode in the 75, east of San Francisco shaft, is irregular, and of a promising appearance, yielding ½ ton of ore per fathom. In the 65, west of San Francisco shaft, the lode is small and compact. The lode in the 55, west of San Francisco shaft, is changeable, and has improved in the last few days, yielding 1 ton of ore per fathom. In the 55, east of San Francisco shaft, the lode is very regular, and opening tribute ground, yielding 1 ton of ore per fathom. The 45, east of San Francisco shaft, continues unproductive.—Los Quinientos Mine: The lode in the 55, west of Cox's shaft, has fallen off a little in value during the past week, yielding 1 ton of ore per fathom. In the 65, west of Taylor's engine shaft, the lode is small, yielding stones of lead ore. In the 65, east of Taylor's engine-shaft, the ground is hard for driving through, and the lode is of no value. The lode in the 55, east of Addis's shaft, is large and open, spotted with lead ore. The lode in the 45, east of Addis's shaft, is large and strong, consisting of quartz and lead ore, yielding ¼ ton of the latter per fathom. The 45, west of Henty's shaft, continues hard and poor. The lode in the 55, west of San Carlos shaft, is large, producing fine lumps of lead, yielding ¼ ton of ore per fathom. The 55, east of San Carlos shaft, is opening up good tribute ground, yielding 2½ tons of ore per fathom. The 45, east of Judd's shaft, has undergone no change to notice since last reported. In the 32, east of Judd's shaft, the ground is more favourable, and the lode looking better, yielding ¼ ton of ore per fathom.—Shafts and Winzes: Good progress is being made in the sinking of Taylor's engine-shaft below the 65. San Carlos shaft, sinking below the 55, is being pushed on as fast as possible. The lode in Barea's winze, sinking below the 55, is large, producing stones of lead ore. Andre's winze, sinking below the 45, is going down in a strong, productive lode, yielding 2 tons of ore per fathom.

ALAMILLOS.—July 16: The lode in the 60 fm. level, west of San Rafael shaft, is large and poor. In the 50 fm. level, west of San Francisco shaft, the lode is very regular, and the ground is hard for driving through. In the 50 fm. level, east of La Magdalena shaft, the lode is small and poor. In the 85 fm. level, west of Taylor's engine-shaft, the lode is much improved, and yielding 1 ton of ore per fathom: it is also large and strong. The 85 fm. level, east of Taylor's engine shaft, is very wet, and progressing slowly. The lode in the 50 fm. level, west of San Jago shaft, is very large, and is opening out a piece of ground yielding 3 tons of ore per fathom. In the 50 fm. level, east of San Victor's shaft, the men are driving north to communicate with Diego's winze, which is on another lode. The lode in the 50 fm. level, west of San Victor's cross-cut, has very much improved in the past week, and is well defined, yielding 1¾ ton of ore per fathom. In the 20, west of Addis's cross cut (south lode), the lode is poor, and the ground very hard. In the 20 fm. level, west of Addis's cross-cut (end lode), the lode contains lead, but not enough to value. The 30 fm. level, east of air shaft, has again improved, and is opening good tribute ground, yielding 1½ ton of ore per fathom. The 30 fathom level, west of air shaft, has become poor, and its driving suspended. There is no improvement in the 40 fm. level, east of air shaft. The 50 fm. level, east of Judd's engine-shaft, has a small branch of lead, but not sufficient to value. In the 50 fm. level cross-cut, south of Judd's engine shaft, the ground is very hard, and letting out plenty of water. The lode in the 50 fm. level, east of Crosby's shaft, produces occasional stones of lead. The 50 fm. level, east of Crosby's cross-cut, will probably be communicated to Judd's cross-cut in the present month. The lode in the 50 fm. level, west of Crosby's cross cut, is very regular, and yields stones of lead. The 30 fm. level, east of Swaffield's shaft, became valueless a few days since. The lode in the 40 fm. level, west of Morris's shaft, is small and poor.—Shafts and Winzes: Judd's engine-shaft, sinking below the 50 fm. level, has an increase of water, which impedes the progress of sinking. The lode in Diego's winze, sinking below the 40 fm. level, is very regular, and has improved a little, yielding ¼ ton of ore per fathom. The lode in Enrique's winze, sinking below the 20 fathom level, has improved: when holed it will lay open a splendid piece of ground, yielding 2 tons of ore per fathom. Molnia's winze, sinking below the 40 fm. level, is to the east of Lorente's winze, and contains spots of lead, and is favourable for sinking. Roberto's winze, sinking below the 40 fm. level, has been resumed, and most of the water that impeded the former working has been let down; the lode yields ½ ton of ore per fathom. The lode in San Carlos shaft sinking below the 30 fm. level, has a good appearance, yielding 1 ton per fathom, and the ground moderately good for sinking.

FORTUNA.—July 16: Canada Incosa: The lode in the 110, west of Henty's shaft, has a little more favourable appearance, and is easier for driving, yielding ½ ton of ore per fathom. In the 100, west of Judd's shaft, the ground is easier for driving, and the lode looking better than it was, producing ½ ton of ore per fathom. The lode in the 80, east of Henty's cross cut, is small and poor, and the ground hard for driving. In the 50, west of San Pedro shaft, the lode consists of calcareous spar, spotted with lead, yielding ½ ton of ore per fathom. The lode is large in the 60, west of San Pedro's shaft, worth ½ ton per fathom, and easy for driving. In the 60, east of San Pedro's shaft, the lode maintains its size and value, yielding 2 tons of ore per fathom. The lode in the 50, east of San Pedro's shaft, is small, and the ground hard for driving. In the 90, east of Addis's shaft, the lode is somewhat disarranged and hard for driving. The lode in the 80, west of Kennely's shaft, is well defined, but continues unproductive. In the 80, west of Lowndes' shaft, the end is easier for driving, and the lode is of a promising and productive appearance, yielding 1 ton of ore per fathom. The lode in the 90, east of Lowndes' shaft, is in unsettled ground; it contains a little lead, but not enough to value. The 80, east of Carro's shaft, has intersected a small cross course, which is probably a part of the large one we have been expecting to meet with for some time past.—Shafts and Winzes: In the sinking of San Federico's shaft below the 40 a good plat has been cut and pent-house fixed. The men will now make good progress in sinking. The sinking of Rafael's winze below the 80 will be resumed in a few days. Belmonte winze, below the 70, remains suspended in consequence of the abundance of water.—Los Salidos Mine: In the 120, west of Morris's shaft, the ground is hard, and the lode small, yielding ½ ton of ore per fathom. The 110, west of Buenos Amigos shaft, is opening fairly productive tribute ground, yielding 1 ton of ore per fathom. The lode in the 100, west of San Carlos shaft, is very small and of no value. In the 90, west of San Carlos shaft, the lode is small and regular, carrying a little lead. The lode in the 120, east of Morris's engine-shaft, has a promising appearance. In the 110, east of Morris's engine-shaft, the lode is very wide, with good lumps of ore, yielding ¼ ton per fathom. The 100, east of San Pablo's shaft, is opening rich ore ground, yielding 3 tons of ore per fathom. The lode in the 90, east of San Miguel shaft, is small and valueless. The lode in the 35, west of Palgrave's shaft, is small and changeable. In the 45, west of Palgrave's shaft, the lode is a compact and a very promising one, yielding 1½ ton of ore per fathom. The lode in the 45, east of Palgrave's shaft, has again improved, producing 3 tons of ore per fathom. In the 35, east of Palgrave's shaft, the lode has fallen off in the past week, yielding ½ ton of ore per fathom.—Shafts and Winzes: There is no change in San Miguel's shaft below the 90, the lode not being in the shaft. Cox's shaft, below the 100, is also off the lode; the men are progressing favourably. The lode in Rubia's winze, sinking below the 25, is changeable, at the present time unproductive. The sinking of Tuerto's winze below the 25 is resumed, the lode compact and productive, yielding 2 tons of ore per fathom. The full complement of ore was returned in the past month, and the stopes are now turning out moderately. The ordinary works at surface are going on very regularly, and the machinery is in good condition. We estimate the returns for July at 350 tons.

LUSITANIAN.—July 15: Palhal: In Taylor's engine-shaft, sinking below the 160, the lode is 9 feet wide, composed of quartz and ore, of which it yields 1¼ ton per fathom. In River shaft, below the 130, the lode is 4 feet wide, composed of quartz. The trip plat at the 130, in this shaft, is now completed.—Levels or Basto's Lode: In the 160, east of Taylor's, the lode is 6 feet wide, of no value, and west of Taylor's, 4½ feet wide, and yielding ½ ton of ore per fathom. The 150 and 140, going east, are unproductive. In the 140 west the lode is 6 in. wide, composed of flookan. East of River shaft, in the 130 and 120, the lode is 5 feet wide, made up of quartz principally, the latter end yielding a little ore. In the 110 the lode is 1½ ft. wide, composed of flookan and schist. In the 90 east the lode is 4 in. wide, composed of black flookan. The lode is 2 feet wide in the 80, and 4 in. wide in the 70, but of no value in either end. The branch in the 38, west of slide lode, is 9 in. wide, composed of quartz and country, with stones of ore. Mill lode, in the 18, east of Taylor's, is worth ½ ton of ore per fathom. In the 38, west of slide lode, it is 8 in. wide, composed of dry flookan. The slide lode, in the 130, north-east and south-west of Taylor's, is unproductive at present. The ground is pretty favourable for driving in the cross-cut at the adit south of branch, west of Perez' shaft. In the rise above the 130, against River shaft, the lode is 3½ feet wide, composed of quartz. The ground in the balance-bob plat, at the 70, in Taylor's shaft, is a little tighter than it has been.—Carvalhal: The great lode in the 40, east of Incline shaft, is 2 feet wide, composed of quartz and stones of lead.—Copper Lode: In the deep adit level, west of River Caima, the lode is 1 foot wide, composed of quartz, mundic, and stones of lead; there is a large stream of water coming out of the lode.—Valley Lode: In the top adit, east of River Caima, the lode on which we are driving to cut the Valley lode is 1 ft. wide, composed of quartz and mundic. The ground about this lode is very favourable for driving through, and we hope to cut the Valley lode by the end of this week.

BENSBERG.—J. W. Hoffman, July 19: I regret that I cannot report the dressing machinery as being in full work yet. The alteration of the steam-lift occupies more time than the makers at first thought, and we have, therefore, only been dressing old slimes. The result is very satisfactory, the stuff which contains before dressing only 3 per cent. being dressed up to 51 per cent. We continued sinking the shaft on Monday last. An interruption occurred during the week by the bend which connects the pump with the delivery pipes breaking. In the open-cast we continued working on the upper levels, the lower levels being too wet yet. The production of carbonate for the week is 30 tons of 32 per cent. assay; ditto rock ore, 20 tons of 10 per cent.; delivered 30 tons of carbonate of 32 per cent. assay.

WEST CANADA.—July 4: Copper Bay: The stope in the bottom of the 50, west of Palmer's shaft, will yield 3 tons of ore per fathom. The stope in the arch in back of the 50, east of this shaft, will also yield 3 tons per fathom. In the bottom of the 35, east of Bray's, the stope is yielding 2½ tons per fathom. We have discontinued the stope in the back of the 60 for the present, and removed the men to stope in the back of the 50. The stope under the 35, west of Palmer's, is also suspended for the time, as it requires to be timbered, and the men are now stoping in the bottom of the 50.

[For remainder of Foreign Mines, see to-day's Journal.]

CHICAGO SILVER MINING COMPANY.—This company shows almost unprecedented vigour in its every department: about 30 tons of ore is being run through daily, producing about 10 tons of bullion, assaying fully 100 ozs. of silver. The new smelters under construction by this company, about 2 miles south of Stockton, on the banks of the lake, are approaching rapid completion. In company with Mr. Latey I made the rounds of their several buildings, and found them both conveniently and substantially constructed. The main building is almost ready to receive the machinery, and an abundance of material to erect the stacks. An unusual precaution is also taken to resist the fiery element. Springs reached by wells supply an abundance of pure water. The office under construction is conveniently located to receive and ship material and products of the works. An ore-house 76 by 12 feet and 12 feet high—sufficiently large to hold several thousand tons of ore—will also be built, and connected with the furnace bui ding by means of an elevated railway. All the modern improvements are fully con-idered in its construction by Mr. Latey and Mr. J. Williams, an experienced smelter, the present foreman of the company. Their mine (the Chicago), under the management of Mr. Potts, continues to yield fully up to the present demand, and with increased force and appliances can be made to yield an inexhaustable supply. The new Hallidie tramway is also approaching completion from the mine to the wagon junction of the canyon. Mr. Godbe, present manager, lately remained a week at the mine, and personally conducted its construction. When completed, this company will be second to none on the Pacific Coast so far as completeness is concerned.—*Salt Lake Tribune*, July 5.

CENTRAL SWEDISH IRON AND STEEL COMPANY.—The directors have prepared their report for presentation at the forthcoming meeting. Mr. D. Forbes, F.R.S., estimated the profits obtainable in the first year from the estates and old works at 11,929*l.*; the amount actually realised has been 15,087*l.*, or about 7½ per cent. on the capital paid up. The 9 per cent. dividend guaranteed by the vendor has been paid to the shareholders. The new works at Björneborg are now nearly completed that the two blast-furnaces are expected to be blown in during next month, and the Bessemer Works immediately afterwards. These works will, it is calculated, turn out about 7000 tons of Bessemer steel and iron per annum, being more than double the present make, and produce an article commanding a much higher price at a comparatively less cost. The most favourable results are therefore anticipated when they are brought into operation. At the forthcoming meeting it will be proposed to subdivide each 50*l.* share into five shares of 10*l.* each.

NEW FOWEY CONSOLS—SPECIAL REPORT.

July 15.—Agreeably to your request I inspected this property to-day, and beg to offer the following observations thereon. I was at first very particularly impressed with its situation. It is literally set in gems, being surrounded by mines which have an established character for richness and productiveness second to none in the county. On the north is Wheal Prosper, a part of which is included in your grant, which has returned considerable quantities of tin. On the west and south, Par Consols, commonly called Mount, stands out most prominently, about which I need hardly say that it has been a mine of very great and lasting riches. In this direction there are several other mines also now in active operation, which are reported to be of considerable promise. On the east stands its nearest and once its richest neighbour—rather sister—the Old Fowey Consols, concerning which it will be quite sufficient to say that it returned to its fortunate owners the handsome and almost fabulous profit of upwards of a million sterling from the copper lodes alone. For a full appreciation of the high importance of a property being situated by so rich a neighbour, I would refer to the plan, which is practically accurate, when it will be seen at once that the lodes in your sett are parallel to those in the Old Fowey Consols, having also both the slide and cross-course, which doubtless made the lodes in that mine so rich and productive. Another feature of great interest and value to a practical miner is that the mine is found so close upon the junction of granite and killas, a position, it is almost unnecessary to say, that has been found throughout the county peculiarly favourable to the formation of very rich and large deposits of ore. Your property is in the killas hard by the granite. I find also that the mine is situated in a high hill, which affords very considerable advantages for working, inasmuch as it will enable you to dispense with costly steam pumping machinery, which, in these times especially, is not a small item. It seems that the ancients drove an adit level for about 50 fathoms, by continuing which another 40 fathoms the Middle lode would be unwatered at a depth of about 25 fathoms under the point where it is now open. But by still prosecuting this level on the course of the lode you could ultimately cross cut, and drain the mine to a depth of at least 60 fm., thus admitting (because driving on the course of the lodes) at the same time both to prove and work the lodes, and to prosecute the adit level also.

Whilst speaking on the position of your property, there is another particular to which I would call your attention—that a stream of water runs through your sett, near to the top of the hill, sufficient to stamp all lodestuff, and even to pump water if necessary. I understand that a lease of the water upon very moderate terms has been offered to the new company. This, of course, is also of great importance, as it will allow you to stamp the lodestuff at a very considerable saving over steam power. Now, more particularly as to the mine itself. The area of the sett is all that could be desired, being nearly a mile square, and contains at least nine lodes, five of which are tin lodes and four copper. These lodes are parallel one to another, and are intersected by a cross-course and a slide, as shown in the plan to which I have already referred. The operations upon any of these lodes at present are not extensive, owing, no doubt, to their discovery being only of a very recent date. The middle lode (tin) has been opened at two places near the junction with the slide, and is there found to be rich indeed. Nearly every stone I examined from the heaps thrown up from the pits, and that I broke from the lode, contained good work, and many of them were solid tin. This lode has a leader of tin from 4 to 6 in. wide, and backs from the adit upon it alone would yield large quantities of tin. For the full proof and development of this property, I would urge that the adit level be cleared and driven forthwith, which may be done in a short time and at a comparatively small outlay: this, I am informed, is what Capt. Parkyn proposes to do, in which I have intimated I fully concur. Looking at the district in which your property is found, the number of lodes and their relative positions, the ascertained value of that wrought upon, and the exceptionally valuable facilities offered for its prompt and thorough prosecution, I am strongly of opinion your sett, when fully and properly developed, will prove of very great value.—GEORGE STEPHENS.

VAN CONSOLS—SPECIAL REPORT.

July 24.—The 60, east of Gundry's, has been driven into a lode of carbonate of barytes 15 in. wide, which is impregnated with lead ore throughout; this has drained both winzes sunk under 45 fm. level, I therefore anticipate meeting with a course of lead ore hourly. There is no alteration in the rise in the back of this level since last report. New stope west of rise is worth 10*l.* per fm. for lead ore. New winze sinking under the 45 is wholly in carbonate of barytes and ore, worth for the latter 30*l.* per fm.; the carbonate we are selecting for sale. Winze under 45, east of above winze, is worth 30*l.* per fm. for lead ore, and improving. The 45 is still producing very fine stones of lead ore, associated with blende, and, from appearances, I do not think we are far off a course of ore of importance. We have a great change for the better in the 25, east of Littles, the lode contains sulphate barytes, and spots of lead for 3 ft. in width; the lode is of great promise, and I think I shall have the pleasure of advising you that a course of ore has been reached at an early date. Nothing new has occurred in the 75 east of western engine-shaft since my last advice, and the stones are just the same as when reported last week. We sold last Monday 100 tons of lead to Messrs. Walker, Parker, and Co., for 16*l.* Our second parcel of the like quantity will be offered for sale in a few days.—JAMES ROACH.

CORNISH MINE SHARE MARKET.—The Share Market has been in a rather a peculiar state during the week. The business has been confined principally to a few monied men quietly picking up stray shares in good dividend-paying stock, which holders have been compelled to part with through pecuniary difficulties; and surely at the extremely low prices ruling buyers cannot do much amiss. It is not likely that prices will go much lower, but the probabilities are in favour of a reaction taking place ultimately, although it seems almost impossible to give anything like a correct opinion on the immediate future. Things generally are just now looking very dull, but if many more mines are knocked (and it seems very probable now) there is a possibility of getting a reduction in the price of labour and materials. The tin market has been very depressed, but during the last two or three days more favourable reports have been circulated. The market seems to be getting firmer, and there is little doubt but it will come right again ere long as the stocks are very low, the supply diminishing and the demand pretty good. The prices of shares have had a heavy drop, and most mines are quoted considerably lower than six months since.

The following are the closing prices:—Carn Brea shares not much dealt in, at 98 to 100. Cook's Kitchen, 17 to 18. A moderate business done in Dolcoath shares, at 48½ to 49½: East Basset, 10 to 11: East Pool, 8 to 9; East Lovell, 15½ to 15¾; Great Wheal Vor, 4½ to 4¾. New Cook's Kitchen shares quiet, at 1 to 1⅛. North Roskear, 5 to 6: shares have had a tremendous drop here; a few months since they were marketable at 32, but now there is scarcely any business at quoted prices: the mine has been looking very poor, but we hear that the prospects have somewhat improved within the past week. Providence Mines, 8 to 9, but nothing doing. Rosewall Hill, 10s. to 15s.: South Carn Brea, 3½ to 3¾: scarcely any business transacted. South Condurrow, 5½ to 6. South Crofty shares as low as 38 to 40, and there have been transactions at even a lower figure. South Dolcoath, 9 to 9¼ (call paid): South Frances, 9 to 10: St. Ives Consols, 10 to 11. A few Tincroft shares have changed hands at about 47 to 48. Unity Wood, 20s. to 22s.: West Basset, 9¼ to 9¾: West Frances, 10 to 12: West Seton, 37 to 39, but no business doing. West Tolgus, 32 to 34; Wheal Kitty (St. Agnes), 13½ to 14, quiet. Wheal Basset shares dull, at 50 to 55. Wheal Margaret, 5½ to 6: Wheal Seton, 42 to 45. Wheal Uny, 3 to 3½.—*West Briton.*

LONDON GENERAL OMNIBUS COMPANY.—Traffic returns for the week ending July 20, 11,801*l.* 10s. 7d.

THE COAL AND IRON DEPOSITS OF VIRGINIA.

The coal fields of Kanawha have formed the subject of many communications, in years gone by, from our old correspondent, Mr. C. Richardson, yet comparatively little has been done for their development, but as a highly interesting paper* has now been published Mr. M. F. MAURY, jun., F.G.S., A.R.S.M., &c., on "The Resources of the Upper Kanawha Coal Fields, with a sketch of the Iron Belt Virginia; setting forth their markets and means of development" it may be hoped that the necessary capital will soon be attracted the district. The rocks of the Kanawha coal field consist entirely the coal measures containing all the varieties of coal known (save thracite) ofttimes equalling and sometimes excelling the most lebrated coals of other noted coal fields. The Kanawha coal mea- es consist of an upper and a lower series, with a very marked stratum, the lack Flint Ledge," between them. Though both are rich in coal, the lower series by far the most so; its thickness is about 950 ft. In a formation only 950 ft. k so great a prolongation of exposures displaying the same division of the coal is throughout could not have existed but for the fortunate occurrence in this of two broad undulations or arcs retaining the strata above the level of the r, when by a continuation of the original north-west dip they would have been ried entirely out of view within one third of the distance along which they are exposed. This lower series is found within a belt about 36 or 37 miles wide, to the north west at an angle of from 20 to 100 ft. per mile, is kept above water el for this distance by two anticlinal curves, and stretches across the country in bove of other disturbances than would result from the elevation of deposits dy split asunder by crevices produced by contraction during the first consoli- ion of the mass from the state of mud and soft sand. In no part of the coal field ere the smallest indication of faulted ground or a single slip or trouble that ld interfer with coal working. There is in all a total thickness of over 63 ft. of kable coal (50 to 55 ft. of clean coal) in 14 seams actually proven on the hill side, above water level in some of the valleys.

The Kanawha coal measures are underlaid by another coal formation, which Mr. ery calls the New River coal field; it is over 1000 ft. thick, and is not so rich in as the one above it, containing, as far as he is aware, only the soft bituminous . On New River, about 20 miles above its junction with Gauley, he examined seams, and was informed of another below: his measurements were 5 ft. 6 in., 6 in., and 4 ft. This last showed simply in a slip on the mountain, but the n who owns it told him that a year or so ago he cut down through the whole kness, finding it to be 7 ft. 1 in. with three partings in it, which left 6 ft. of n coal. The other seams were all clean coal, of a very soft but extremely rich pure variety, and would have to be coked in every case for use in blast furnaces, ey are too tender to bear the weight of a charge. The upper member of this s disappears below water level a very short distance below the Kanawha Falls, is seen no more above the level of the river, but the coals could be got by shafts. the quality of the coal generally, it is remarked in a recent reliable work that coal fields of the Kanawha region are superior to those of Great Britain or nsylvania. They are regarded by eminent gentlemen as the finest deposit of in the world. The quality of Kanawha cannel is equal to the best English, ituminous is equal to the best found in Pennsylvania, and Kanawha splint melting iron is unsurpassed. The veins lie nearly horizontal, and vary from to 15 ft. in thickness, and the aggregate thickness of the various seams in some ities amounts to 40 or 50 ft. of solid coal. Though the whole of the Kanawha ey is remarkable for its coal deposits, there is one belt exceptionally so, seem- to constitute the heart of the coal field: its limits have not yet been clearly de- d, but it is about 20 miles wide, and Coalburg and Paint Creeks lie on each side central line. It is in this belt that lie the valuable Cannelton coal mines, the Dominion mines, those of Paint Creek and at Coalburg, the Sebastopol seam, Winifrede Coal Company's mines, those of Peytona on Coal River, and all s, except two, which have been worked on the lower series of measures.

owing to the existence of the more important and valuable splint and cannel in this field comparatively little notice has been taken of the bituminous coal, consequently but little is known of it beyond the fact of its existence in large ntities; but it is established on the authority of the report made by the En Department to the Secretary of the United States that the bituminous coals he great Kanawha coal field are equal to the best bituminous found in Pennsyl- ia; and there is every reason, now that it has communication by the Chesa- ke and Ohio Railroad with market, that this coal field should run Pennsylvania ard race in the production of this class of fuel. Analyses by Prof. Locke, of cinnati, show the Winnifrede Company's seam (rather a splinty bituminous) e equal to the Youghiogheny, of Pennsylvania, and superior to the Pomeroy Ohio. The splint coal is abundant, and either alone or in admixture with a ll quantity of bituminous is the most valuable coal present, the seams ranging igh as 12 ft. thick (as at Sebastopol, on Paint Creek), besides being more nume- s. It is of superior quality, its value being due to its firmness and solidity. ch enables it to be handled, shipped, and stored with very little loss: it burns l, leaving but little ash, has both high calorific power and intensity, is usually arkably free from sulphur (iron pyrites) and other impurities, has little or no ency to clinker, is free from the danger of firing by spontaneous combustion— reat desideratum in storage and ocean transportation, is first rate as a steam , and has a particular adaptability in the raw state to the manufacture of iron he blast-furnace. In Ohio this same family of coal, which there bears the name block," forms the fuel by which fully half of the iron in the State is manu- ured. The cannel coal seams of Kanawha vary from 5 ft. down, and exposures found in very many places throughout the coal field. It is universally asso- ed with some other kind of coal usually bituminous; a very fortunate circum- nce, as the "bearing in" can be done in this latter, leaving the whole of the nel available, and as it separates very easily from other coals, a 10 or 12-inch um in a large seam can be gotten out profitably and shipped by itself. The e of this coal is as a household fuel and as a gas producer. As the latter it has perior, for that from this coal field as far as it has been tested occupies the est position of any known, save only that from Boghead, Scotland. Analyses w the Kanawha cannels to yield from 11,642 to 13,200 cubic feet of gas per ton, t the Boghead yields 15,428, according to Dr. Fyfe. There are many seams ituminous schist or cannel shale, which burns well, evolving great heat, and ing readily, but it leaves so large an amount of ash as to render it unfitted for . It seems to be almost, if not quite, as rich in oils as cannel itself, and at Gallee, Pa., best quality oil is produced from similar shales at 3½ c. per on, with a plant valued at $30,000. The last published statistics give the ave- e market price of oil in the Titusville oil region at a fraction over $4·40 per barrel. e salt of the Kanawha Valley has long been favourably known, particularly in South and West, as a most superior article, and has generally commanded a ference in whatever market it was introduced into. Before the war the product 3,000,000 bushels annually; it has the advantage of being free from the bitter of lime and magnesia (bitterns), and has to go through no special process of fication, being put directly from the evaporating troughs into the barrels. The erous formation underlies the whole coal field, and from it comes the brines upply the furnaces in Mason County on the Ohio, while higher up the Kanawha in Braxton, Webster, Fayette, and Greenbrier Counties it has also been struck, never manufactured on any scale. The water-power available is equivalent to sands of horse-power, and the extent and variety of the timber is, perhaps, markably fine as are the deposits of coal.

The iron to be found within the Virginias is represented by those belonging to Appalachian coal measures, and those belonging to the great iron formation ng between the Alleghany Mountains and the Blue Ridge. The first class is by means so rich or so abundant as the second. It consists of the brown oxides carbonates of iron. The second-class are a part of that great iron belt of the ted States, which, beginning in New York, runs through Pennsylvania, fur- ing many of the largest furnaces of that State with their stock, crosses Mary- d, passes through the entire width of Virginia, constitutes the iron region of t Tennessee, Western North Carolina, and North-Western Georgia, and ends in unparalleled and magnificent deposits of Alabama. Mr. Maury does not seem have yet given the ironstones so much attention as the coals, but he has seen ugh of them to ascertain that there are in Virginia all the classes of iron ore uired to make metal of good quality. Throughout the paper he gives evidence having carefully tested the accuracy of the statements he has made, and it is in y respect calculated to prove of great value to intending capitalists disposed to est in Virginian undertakings, and to aid the development of the great resources the State.

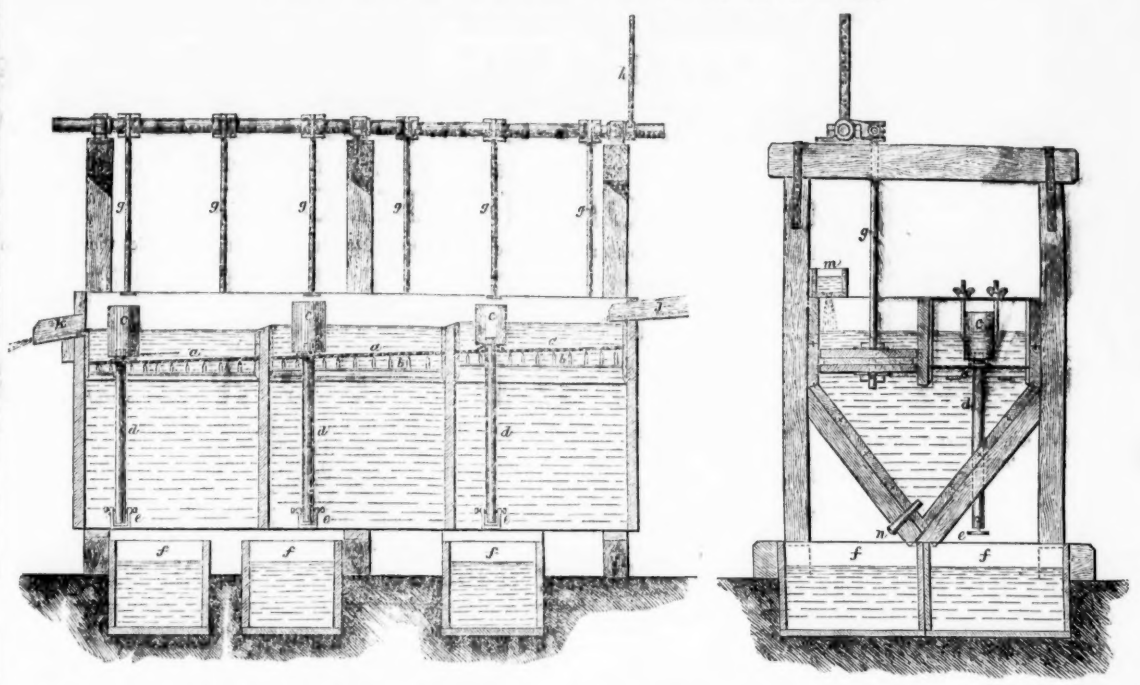
* Issued through Mr. W. GRAHAM, Bates-street, Detroit.

ELEMENTS OF MENSURATION.—The thoroughly utilitarian cha- ter of Mr. GLEIG'S "School Series" (issued by Messrs. Longmans) is already known, and as a knowledge of mensuration and land surveying can be turned advantage by a very large number of the readers of the Journal, the revised edi- of the "Elements of Mensuration and Land Surveying," by the Rev. John nter, M.A., may be particularly noticed. The little volume, although contain- about 120 pages, supplies a large amount of information, and there is little bt that the author's hope will be realised that the peculiar arrangement cha- terising the work will prove in the hands of other teachers, as it has done in his own, a means of promoting the intelligent and expeditious progress of the pil. The introductory explanations and chapter on geometrical constructions rd ample groundwork for the pupil to work upon, and enable him to study the aining portions of the book. The simplified method of finding the circum- ence of a circle when the diameter is given will, in many cases, much shorten rious calculations, and there are many other little hints in the book which are l worth attention. Now that mine managers will have to pass an examination qualify them for their position, such treatises as the present will prove extremely kable to them.

VENTILATING MINES.—According to the invention of Mr. R. S. TAYLOR, of Longdon Mills, near Wellington, Salop, a vertical flue or channel in the e shaft is connected on the face of the earth with the exhaust side of the drum cover of a rotating fan, the bottom of the vertical flue or channel being connected h branch pipes, which extend to the upper and lower portions of the workings. these branch pipes small supplementary pipes, provided with valves or stop- ks, are connected, which last mentioned pipes ramify into all the principal upper lower portions of the workings. By means of the valves or stop-cocks any por- flue or channel in the mine shaft, and by the exhaust action of the fan the foul may be rapidly removed, fresh air entering the mine by the shaft or by a second e or channel in the shaft. The mine is thereby effectually ventilated, and the ger of explosion from fire-damp and suffocation from choke-damp is thereby ated.

NEW MOTIVE POWER ENGINE.—The invention of Mr. G. T. de RICADO, of Paris, relates to a motive-power engine actuated by soluble gases, such chlorhydric acid gas, ammoniac or metillyac gas, or any gas having the property dilating at a low temperature and condensing with equal facility. The soluble separates itself in a heated generator from the liquid which had dissolved it, passes into a reservoir, from whence it is distributed to the cylinders, after act- ording liquid which forced by the gas from the generator has passed through a ket surrounding the gas reservoir, and from thence to the condenser. After com- e absorption of the gas by the liquid, the solution made in the condenser goes receiver, and from thence to the generator, where the separation again takes ace, the gas and liquid again make the same circuit, and so on indefinitely.

ORE-DRESSING MACHINERY.



ORE-DRESSING MACHINERY—No. XXVI.

CONTINUOUS COARSE SAND JIGGER.

The jigger illustrated is composed of three sieves, three pistons, a rocking shaft, discharging caps, and pipes—*a*, inclined sieve bottoms; *b*, wooden grids for supporting sieve bottoms; *c*, sheet-iron caps fitted with fly nuts; *d*, sheet-iron discharging pipes; *e*, regulators for increasing or lessening the discharging area of the pipes; *f*, ore boxes, one set for receiving stuff from sieve bottoms, the other for retaining the stuff passed from the sieve receptacles through the plug holes, *n*; *g*, rods, two being attached to each piston; *h*, rocking arm; *j*, inlet launder; *k*, outlet shoot; *m*, launder for supplying jigging and skimming water. The holes in the sieves are smaller than the grains of ore to be treated. When stuff is introduced at *j*, it is rapidly progressed towards the first bridge; the ore, or heaviest portion settles on the sieve, and continually passes through the first pipe, *d*. At the same time the upper stratum is projected into the second sieve, and subjected to a like mechanical treatment, the process being repeated in the third sieve. By raising or lowering the caps or cylinders, the quantity of stuff passed into the pipes is regulated to the richness of the stuff. The width of the sieves may be from 18 in. to 36 in., length of each sieve from 24 in. to 48 in. For an ore simply associated with worthless veinstone, two sieves will suffice, but for the treatment of mixed ores a greater number of sieves should be employed. The number of strokes may vary from 70 to 100 per minute; the length will increase with the diameter of the grains to be treated. The apparatus itself will successfully jig suitably sized grains from two to six millimetres. Instead of a rocking shaft adjustable eccentrics may be used.

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For list of same see German Official and "British Section" Catalogues.

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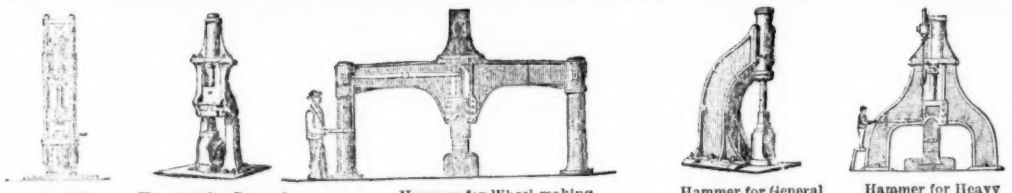

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References, particulars, Estimates, &c., Sent on application.

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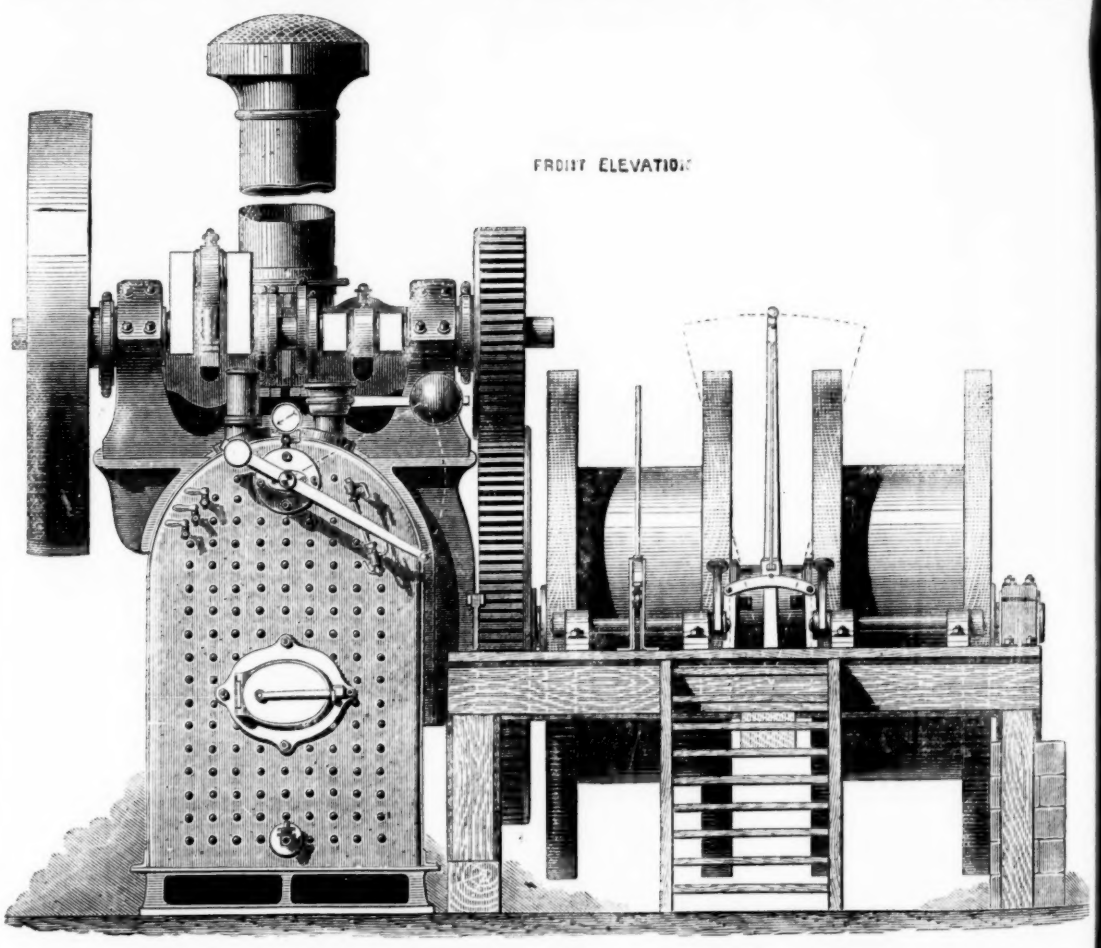

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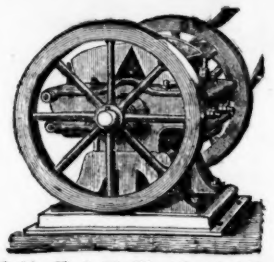

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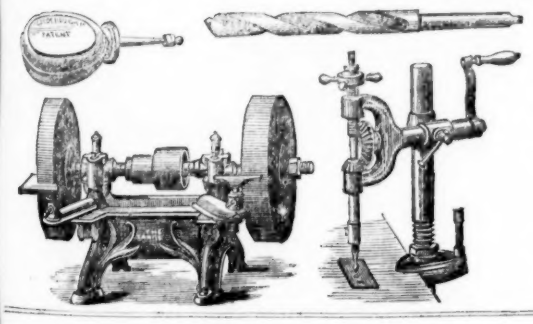

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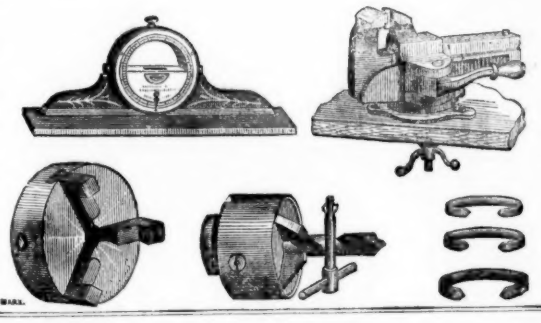

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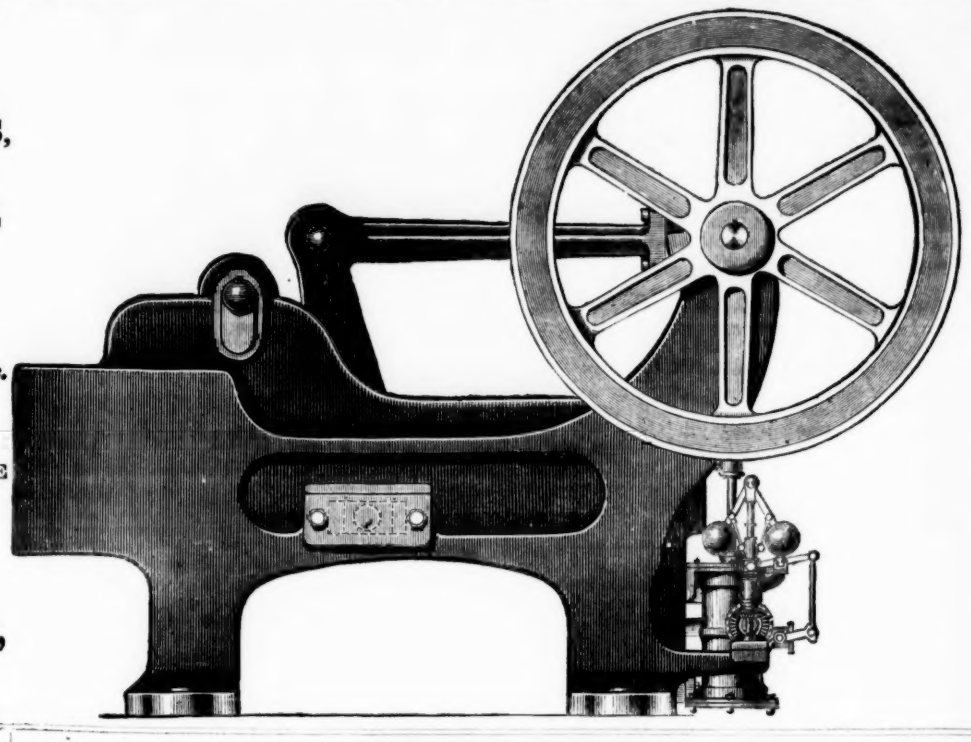

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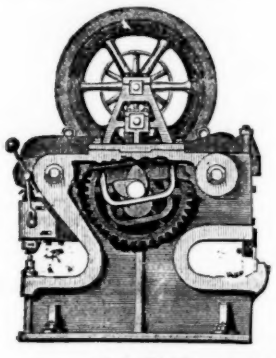

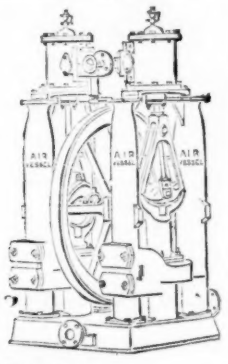

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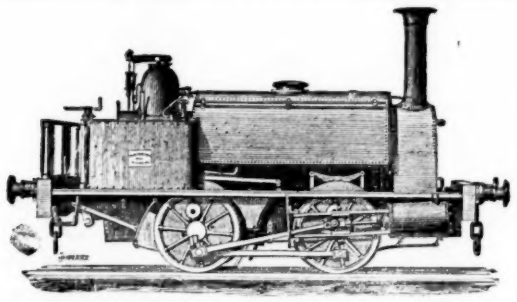

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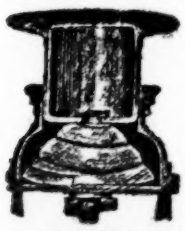

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